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SCHOOL ACTIVITIES AND EQUIPMENT

A Guide to Materials and Equipment

FOR ELEMENTARY SCHOOLS

BY

ROSE B. KNOX

Formerly of Mississippi State College for Women
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TO

PROFESSOR FANNIE WYCHE DUNN

OF TEACHERS COLLEGE OF COLUMBIA UNIVERSITY

WHOSE INTEREST

HELP AND CONSTRUCTIVE CRITICISM

THROUGHOUT THE ENTIRE PERIOD

OF WRITING THIS BOOK

HAVE HELPED GREATLY IN MAKING IT

A REALITY

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INTRODUCTION

Long before the development of modern psychology, Comenius recognized the fact that education is a process of growth through experiences relating to the world of everyday activities. Comenius was unable to develop clearly any systematic plan for utilizing the experiences of daily life as a means of intellectual and social growth. Pestalozzi appreciated the need for experience with things in promoting mental growth, but his emphasis upon sense-training gave rise to practices that were partial and formal. Froebel placed greater emphasis upon activities, but he so systematized the activities which he organized that they became highly artificial, and they were interpreted in such a maze of mysticism and symbolism that they contributed little to the use of experiences making up the activities required in life. With the coming of the several forms of modern behavioristic psychology, a new pedagogy arose from which educational practice harmonizing the various aspects of mental growth and life activities could be derived. When William James emphasized the formation of "acquired habits of conduct and tendencies to behavior" as the essential factors in education, and John Dewey defined education as "the reconstruction of experience giving it a more socialized value," the way was pointed for the development of the modern "activity" school procedures and the "activity" curricula. Such school procedures and curricula may now be defended upon the basis of a philosophy of education and an educational psychology that are in consistent harmony in making purposeful activities and experiences the basic factors in education. Education is a succession of experiences by which

learners grow in power and efficiency to participate in all of the activities of a wholesome and satisfying life.

Coming to a clear understanding of the principles of growth or education is, however, but the beginning. To see and appreciate the general pattern or plan in theory, once it is well stated, is far more simple than applying the theory effectively in concrete practice. To think through to acceptance of the principles involved, one may disregard many of the stubborn facts of individual differences, variations in environment, limitations of resources, personal and community prejudices, and traditional habits and attitudes. But in applying these principles, all of these factors have to be reckoned with. Activities and experiences have to be chosen which are practicably possible under the conditions of the particular class or school in a particular community. Among such experiences as are possible those must be chosen which inherently include opportunity for growth. Some experiences are highly educative in possibility, others are much less so. To select wisely, the teacher must be clearly aware, not only of the principles which he is to apply, of the goals to be achieved and of the contributions of the subjects of the curriculum to growth in achieving such goals, but he must also use good judgment in eliminating unfruitful activities and choosing those that contribute to growth and lead on to new experiences that are fruitful.

One of the difficulties that have confronted the teacher who believes thoroughly in the use of practical activities has been that of securing the appropriate materials and equipment. Although such materials and equipment are not excessively expensive, they are of great variety and their sources are very numerous. Since they are not standardized as are textbooks and laboratory supplies, no one supply house has an adequate array of materials to furnish all of the varied needs. To make available lists of sources from which

all kinds of required materials may be secured has been a task of much intelligent and painstaking labor. This achievement will be appreciated by teachers as a means both of increasing the extent to which appropriate materials will be used, and of saving time in searching for sources of supplies.

In this book, Miss Knox has summarized the results of her own experience through a score of years, and the experiences also of many other teachers in the selection, use and testing of many educative activities and materials. The work of no one teacher can be bodily adopted by another. Conditions vary and teachers themselves vary. Activities, materials and procedures must vary correspondingly. But by the wealth of activities and the variety of resources she has included from many tested sources, Miss Knox has here accumulated such a number of successful illustrative examples that teachers in elementary schools, wherever they may be, may either select those which are adapted to their classes, or find stimulating suggestions for other activities which they may initiate for themselves. In using the book, the author has no thought of limiting the teacher to the activities included. Her aim has been to stimulate resourcefulness and originality in seeing and using educative opportunities by the teacher in his own environment.

While the activities in many cases may vary greatly from those suggested in the book, the materials required for them will not vary to such a degree. The materials needed for the experiences described or suggested in the book may also be used for many others. Practically, the only materials needed for any appropriate activity not included in the book are those that may be found locally in the community in which the activity is carried on. There are always local materials, situations, and other resources which any efficient teacher will use, and which are so varied and numerous that

it would not be practicable to attempt their enumeration.

The content of this book is so presented that teachers may use it whether their curricula are organized on a subject-matter basis or on an activity basis. Many schools are frankly combining the use of a modified project method and a subject organization of their curricula. In the gradual transition from the older, more fixed and formal courses of study to a less formal, activity basis, the content of this book is well adapted. It is not limited to any subject nor to any particular form of school organization. The principles stated and illustrated in the book represent an education developed through participation in all of life's wholesome, appropriate activities with the help of the accumulated results of race experience. These principles include also the whole-hearted, enthusiastic use of the children's powers of initiative, planning, constructing, investigating, and appreciating. The author has not only stated the principles in a simple, readable, and usable form, but she has shown the practical ways of applying them in typical school situations. While she emphasizes strongly the "what to do and how to do it," she gives enough of the "why" to make the doing intelligent and sound educationally.

Such activities as are described and suggested are the occasion and the opportunity for the development of most of those quantities of citizenship and moral conduct for which our day and generation seem to be in serious need. Most of these experiences involve both individual and social action. Coöperation, consideration of the well being of others, bearing personal responsibility, and all of the other qualities of fair play and good sportsmanship are brought into prominence in the conduct of the work.

In presenting the results of her long experience as a teacher of children, as a school supervisor, and as a teacher of teachers, Miss Knox has contributed richly to all who will

use this book. She has contributed even more richly to the children who will profit by the use of activities and materials of the types she has suggested. Wherever the book is used, I anticipate that it will add much to the growth in efficiency and to the pleasure of both teachers and children. It is a privilege to commend it to teachers as a substantial aid in promoting the growth of children in their participation in the essential activities which make up the conduct of wholesome and efficient life.

FREDERICK G. BONSER

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PREFACE

This study is planned for the entire elementary school from the kindergarten through the sixth or seventh grades. Except as regards organization and treatment, no claims are made for originality. Here is frankly a compilation which attempts to select and organize some (by no means all) of the scattered information about school materials, supplies, and equipment, and to place this in an educational setting. The discussions naturally will include such fundamentals as the principles of selection and use, and such practical matters as sources, care, and method.

The educational background is, obviously, that of John Dewey, Frederick G. Bonser, and other modern exponents of education.

All materials and plans given have actually been used by some group of children — in many cases in rural schools or in overcrowded grades of the small town or city systems, under teachers who have had no special training save in summer schools, and where money for supplies was scarce indeed. Hence, in one way or another, these same materials and plans should be usable by others.

The collecting of this material has been done as follows:

(*a*) Through visiting widely schools of varied types in many sections of the country, and noting equipment, materials, uses.

(*b*) Through discussing with teachers, both while visiting schools and in summer schools and institutes, their needs, lacks, and helpful experiences along these lines.

(*c*) Through examining hundreds of trade catalogues, advertising bulletins, pamphlets, and other printed ma-

terials issued by educational or semi-educational organizations, and by the state, city, and county, or national departments of education.

(*d*) Through many letters giving data, experiences, and advice, which have been received from supervisors, principals, school buyers, and teachers in answer to definite requests.

In making the final selection of each item, personal investigation and examination, tests with students — mature and immature — or definite recommendation by those who have had actual experience with the thing considered, were used as check-ups.

Obviously in such a book there must be some inaccuracies and also omissions of worth-while and interesting things. In some cases available data was insufficient, or changing so rapidly that no direct recommendation could be made; in others the material was fully covered elsewhere, in still others it was unknown to the writer.

It seems well to emphasize the fact that no school is supposed to have everything suggested, but that each school will select what is best suited to its own special needs. All quantities and selective lists are suggestive, not final. Again, all *prices* quoted are *approximate* and of 1926 lists. All addresses of sources given in the text may be found in the Appendix, as will also lists of books and references.

The writer earnestly hopes that the work now offered may serve effectively in supplementing the many excellent books on educational theory and practice already in circulation, and that it may make possible a wider use of plans and materials that some teachers and schools have found helpful and practical.

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THE POINT OF VIEW: "NEW SCHOOLS FOR OLD"

TRANSFORMATION scenes are dear to every one. This has always been true. The olden folk were thrilled, as is even the modern child, by the horrid toad who became the handsome prince; the ugly witch who changed into the beautiful princess; the magician whose power turned a dismal hut into a wondrous palace. Equally fascinating is the making-over game of actual life. Whether we work with clothes, houses, furniture, or what not, there is great satisfaction in taking the old, useless, ugly, or commonplace thing and producing in its place something which is new, beautiful, useful or interesting.

Now this universal interest may enter most effectively into school matters. What is more interesting than to have a part in transforming an unattractive, unsuitable school into a well-planned, attractive place for children, who are living to-day as well as preparing for life to-morrow — a fact that a good many people seem to forget.

When we come to think of it, just about the most short-sighted policy in the world is to leave the youngsters hour after hour, day after day, year after year, for so much of their time, in any but the most desirable conditions.

"New Schools for Old" [1] — Miss Dewey's happy paraphrase — seems, then, a good slogan for any community. A crusade to bring about such a transformation would be a worthy one, indeed, in which to lead children, parents, and community.

But what kind of new school shall come in place of the old?

[1] Evelyn Dewey: *New Schools for Old.* E. P. Dutton & Co.

This must be clear before any change is begun. The question can only be answered by asking another — What are the needs of the children who are to use the new school? Since about all that any school can do is to offer the environment and materials through which these needs can best be realized, details depend entirely on what the teachers are trying to accomplish.

Now the needs of the elementary school child have been pretty clearly worked out and the laws of his growth established by such educational leaders as Dewey, Thorndike, Gesell, Kirkpatrick, and many others.

Briefly speaking, every child needs a healthy body and good habits of both mind and body; an alert, well-organized mind; many and widening interests; a sense of fair play and honesty; the ability to live and work with others; the ability to read, to write, to speak, to use numbers easily and efficiently; and — most important — a constantly increasing capacity for appreciating beauty, fineness, and the things of the spirit.

Again, psychologists say that none of these qualities or skills will spring up overnight or in a few days, but that they are of slow growth. That in order to grow a child must be active; that he must have freedom to move and the privilege, in both work and play, of investigating and trying out his own ideas, feelings, and interests, rather than those of grown-ups. He must have many real experiences, and he must think things out for himself.

So first of all, and last of all too, the new school must be a place where children can grow — happily, naturally, continuously. This measure applies everywhere and to everything.

In all plans, then, there should be thought for both beauty and utility; for practical detail and fundamental principles; for healthy, well-developed bodies and eager, questioning

minds, and for the awakening spiritual life of boys and girls in this tremendously important period of their lives.

So the "new school for old" is an attractive building that stands, high and uncrowded, back from the noise and dust of street or highway, with shady places and grassy spaces, with trees, flowers and birds, and — not always, but most enchanting if there — a brook. A playground with a ball field, and a play field, a few strong pieces of apparatus, a big sand pile, a flourishing school garden with many plots, a small yard for pets and animals, a bird bath and feeding station — all suggest many interests and activities. Everything looks clean and well cared for: shining windows, fresh paint; mended fences; tidy walks, carefully worked garden. Everywhere order — and yet there is an air of friendliness about the whole place which seems to say that children are not only "allowed" but are welcome and happy there.

Indoors, the general effect is also a happy one, with spacious, well-lighted halls and rooms, pleasant colors and attractive furnishings. Hygiene and sanitation are considered at every point. There is an assembly hall which can be used as a gymnasium or as a playroom if need be; a library-museum; a tiny "sick-room"; a rest room for teachers; a kitchen or kitchenette; an office, toilets, and perhaps a cafeteria and a shop.

The halls are well-lighted and wide. Near the entrance is a large bulletin board; and if the school is in session we see children singly or in groups eagerly studying the notices. In the hall we find, perhaps, some wall show cases with interesting exhibits, some large, colored pictures, or some industrial charts or pictures. A window or a turn in the stairs holds greenery, flowers, or a good cast. The assembly room contains a stage and is done in good colors as to walls, woodwork and stage curtains, with large brilliant color prints in series or sequence groups — of landscape and industrial friezes;

while masses of green foliage or bright flowers and suitable lighting contribute a feeling of general satisfaction and pleasure. The principal's office, with comfortable furniture, a rug, restful walls and a few flowers, makes for peace and quiet, and offers a refuge where frazzled nerves can relax. A little wait here, it is easy to see, may relieve friction or help to make easier difficult interviews and matters of discipline. The filing case, the card catalogue, and other details are signs, also, of a business-like organization. Glimpses into the museum-library, with its many specimens, collections, and charts and interesting books, and into the play room and work shop, make us feel with satisfaction that here is, indeed, a place that offers an equal chance for the small bookworm, the practical-handed and practical-minded pupil, and the quick, active worker and thinker. The immaculate "sick-room," with its cots, first-aid cabinet, and scales, shows that injury or accident is quickly and efficiently met. The small, neat kitchen testifies of well-nourished children who may have a hot lunch, milk, or other food when they are hungry.

The classrooms offer interesting signs of the children who work there. Each room seems especially suited to the group for which it is intended. The primary room with its work and play material, tiny chairs, low boards and tables welcomes the small stranger fresh from home and mother; the upper grade rooms seem to say that real work and individual effort and control are in order there. Walls are of soft tan, buff, green, or gray, with light ceilings; furniture and woodwork and window shades tone with them, so that there is no jar for the eye, but instead a genial sense of space, restfulness, and freedom. A rug of plain color, a low, comfortable chair or two for teacher or visitor, sash curtains and flowers or plants, painted or cretonne-covered book-ends on a single shelf, or on the book table, a few good pictures in color on the

wall — all these add to the interest of the room and make for the intangible thing that we call "atmosphere." The blackboard is clean and frankly itself, without any camouflage of chalk pictures, borders, stencils, or calendars, and just high enough for proper reach. Bulletin boards take care of notices, special pictures, and other temporary material. Both teachers and children find that short cuts are made possible by the use of typewriter, paper cutter, pencil, and other time-savers.

The furniture is movable and arranged in informal groups or pushed against the wall as is best at the moment; of course, there is a workbench or work table. Built-in shelves and boxes or lockers are here to take care of materials for handwork. There is much of this, for the children paint, draw, model, sew, do carpentry work, and garden, as well as read and write. Behind a low screen by a corner window is a book table or a shelf with attractive and well-chosen books, and two or three chairs. Other screens or movable cases are used to fence off a "work shop" and to keep chips and unfinished work within bounds; for the teacher in *this* school knows that it is not necessary to have material all over the place to show a creative spirit and that a disorderly, mussy room is as bad at school as at home. The small movable piano or the phonograph is brought in for a music period and then is passed on to another group.

Everything is conveniently arranged. There is no danger that a child who wants to work on his wagon or his toy will collide with another child who needs to sharpen his pencil. The book table is off at one side, the bulletin board is in plain view, and cupboards and boxes are where they should be. Paint, brushes and paper, tools, bench, and wood, are conveniently close together for the small workers' use.

Opening out of each large room are two smaller rooms.

One of these latter is a group room, which the teacher says is of the greatest comfort and help, for there these children may go who need to be away from the others. Sometimes they are a noisy group doing carpentry work or rehearsing a play, sometimes a group who must concentrate on reading or study. There is little furniture in this room except some work tables and extra chairs, and perhaps the workbench. The other smaller room is a coat room, which, like the first opens into the hall. It contains lockers or a rod with coat hangers and shelves. Two or three wash basins, and other equipment for washing and drinking are also here.

The lighting arrangements catch the attention. The light comes from the left or from above, and the shades are easily adjustable so that no glare, shadow, or direct sunlight need fall on the children's work. There is artificial light for use at night or on a dark day. A thermometer hangs on an inner wall where it may be frequently consulted in winter weather; the temperature is kept at about 68 degrees. Windows and transoms, properly adjusted, keep the air fresh and comfortable.

A pleasant picture truly! Impossible? Not at all.

Few schools, of course, have all the details described here; in fact, since conditions vary so greatly, many do not need them all. But it is likewise true that few schools make the most of their possibilities; and that even the poorest can have some share in such a plan.

How can all this be done? There are many answers to that question, but they all include as requisites determination, patience, and a fixed ideal — whether the problem be large or small; whether the school is one room in the country or is a crowded city building. And much *is* being done by the occasional schools scattered here and there — some widely talked of, others unknown or quietly working along

without encouragement, each pointing the way toward new effort for others. Bare ugly grounds? No excuse for that at all! Ugly, dirty, inconvenient houses? Soap and water, calcimine and paint, saw and hammer, and good hard work flavored with a little good taste, will make a mighty difference in the building.

In a certain poor rural community, a dingy one-room school house with dirty ceiled walls, scarred benches and ancient home-made desks and a hard, bare, clay yard, became transformed by the teacher's vision and the children's work, with just a little help from outside in painting the upper walls. The desks were taken up and screwed on wooden strips to the floor; some shelves and window seats were built in; then everything was painted. Soft, light-gray paint was used on the upper walls and white on the ceiling, while the desks, shelves, door and window facings and lower panelling were renovated with a dark gray which covered the discolored places and "pulled together" the rough furniture. New curtains of thin, unbleached cotton were hung. Several old earthenware crocks and churns were obtained, and two of them and several assorted jars and cans were painted a vivid citron yellow with some left-over wagon paint that one of the children brought; the others were painted a soft blue, which was made by adding ultra-marine blue (artist oil paint) to the wall paint. These utensils were filled with masses of flowers, greens, and growing plants, and with the aid of one large bright poster, gave the color that was needed.

Outside, the weathered gray of the house was left as it was, but some old discarded shutters were mended, painted with green wagon paint toned down with light gray, and hung at the windows. The yard was a problem, but slowly and after hard work the packed clay was pulverized. Then parents sent small gifts of fertilizers and the children

brought earth from the woods, and after a while it was possible to grow something in the soil. Yellow, blue and purple were chosen for the basic colors of the planting scheme, and from interested friends and from the woods and fields, came seeds, cuttings, bulbs, and shrubs. Goldenrod, black-eyed-susans, wild azalias, daffodils and lilies, crocuses, hardy marigolds, purple flags, blue periwinkle, and a wisteria vine, settled down as permanent dwellers, and small beds produced pansies and other chosen flowers. Some old bricks were used for paving the paths. The final result was a beauty spot that delighted all who passed. Needless to say, the children of that school were having a remarkable course in art work, appreciation, and decoration.

In another school a dark hall was completely made over with a little time and effort. Windows were cut out in the front and at the back, the ceiling and walls were calcimined in yellow, bright posters were hung, and a big bulletin board and shelves and cases for collections or exhibits were installed. The dingy hall was changed into an interesting and attractive place.

The principal of a large suburban school, where the class rooms varied from the barren, forlorn type to the confused, overdecorated, cluttered-up kind of place, interested the teachers and children in a make-over process. Together they planned and worked out restful, harmonious, and attractive rooms which were a satisfaction to all who came into them.

A city school situated in a small lot altered the whole outside appearance of the place with a few well-arranged shrubs and grass borders which were the pride of every child in school.

No materials? The woods and fields, the carpenter's shop, the stores, and the home kitchen offer material freely.

A rural school without money or material wanted to show

an Indian scene. On the floor of a small porch the workers made, with some earth, moss, rocks, and diminutive pine trees, a realistic settling of woods and water. An old tin pan, filled with water and banked with moss and tiny ferns provided a beautiful lake. Corn husks, softened and dyed with walnut hulls, served as skins for the wigwams. The Indians were made of corn cobs with potato heads cleverly marked, and were dressed in the soft inside husks from dried corn. Strings of colored seeds made gay beads and a few small, gay feathers adorned the warriors' headdresses. Clay from the road-bed provided material for the dishes and pots; the baskets and mats were made of dried grasses, the canoes of thin wood, and the bows and arrows and wigwam poles were twigs. The finished work was a thing of beauty with a real atmosphere of woods and freedom and primitive living.

At another school the children made charming rustic bird houses of bark and wood from nearby trees.

Some big packing boxes, each open on one side and provided with a slanting top, made fine outdoor "houses." A group of Second Graders carried on all sorts of activities in them. A box became in turn a home, a store, a post office, a railway station, a cotton warehouse and a gin, as the project changed. Since then the "houses" have served still other purposes. The country storekeeper who gave them is a popular man with the youngsters.

An out-of-date wall paper sample book provided a first-grade group with pieces of paper that they could paint on the plain side or cut up for decorating boxes and costumes.

No money? But this is anticipating too much!

The chapters that follow will take up the tale of ways and means, of teaching material and other equipment, as well as some of the practical problems which grow out of these projects. This tale is told by many people, in many parts of

the country, from many kinds of schools — people who have found in some measure, large or small, many answers to the problems which beset the teachers, principals, school-buyers, and parents who are trying to obtain "New Schools for Old."

SCHOOL ACTIVITIES AND EQUIPMENT

PART ONE

TEACHING MATERIALS RELATED TO CURRICULAR ACTIVITIES

SCHOOL ACTIVITIES AND EQUIPMENT

CHAPTER ONE

CURRICULAR ACTIVITIES AND MATERIALS

MEANING By curricular activities we mean the varied school activities growing out of the "Course of Study," which is usually cut up into the bits called History, Music, Play, Geography, Science, Art, Reading, Industrial Arts, Spelling, Arithmetic, and so forth.

Needless to say, and this will be repeated many times in the following chapters, there are no such hard and fast distinctions in the modern scheme of education, for each subject must draw, in some measure, from some other one. Nor is any activity likely to "stay put," as it were, in any particular subject. A topic which begins in the history class may at any moment skip out of such narrow limits and become identified with geography, science, civics, art, or music, while reading, writing, dramatic play, and construction may be needed in addition for a successful outcome.

For example, Indian Life is a history or geography topic to begin with, but as the work develops the art period is needed for study and reproduction of the beautiful designs and workmanship in pottery, weaving, or beadwork. The legends and old stories are in many cases real literature, while the life of these interesting people is so fascinating that the children read eagerly all the books available about them and perhaps write and act a play. They also make wigwams, bows and arrows, and other things used by the Indians.

Again, a bit of Persian tapestry, or the representation of a fragment of a Greek frieze may catch the attention of the children as mere bits of beauty; but the first few questions that it stirs — "Who made it?" "Where did it come from?" "Of what use was it?" — bring in history, geography, or some other phase of study and start a new cycle of investigation.

MATERIALS; EQUIPMENT

It happens also that materials and equipment for one school subject often belong equally to others. We should note, too, that many things bought to fill practical needs may also be used for educational purposes. Organization is very difficult, and in many cases equipment needs several placings before the whole story of its usefulness is told. For example, the clock, a practical necessity, is used in teaching arithmetic; the book on "Colonial Children" gives at once material for a reading lesson and for a history lesson; the thermometer is a part of the health equipment, but in compiling weather and heat records and in emphasizing certain points in science and arithmetic, it has distinct schoolroom value.

The equipment and materials that are needed all along the line seem to fall into certain very general classes, though here again there are many duplications and crossings of the line.

First: There are the things which will help the children in *expressing* their ideas, interests, and feelings of all kinds. There are many methods of expression. The youngster sings his own songs or those that other people have made. He paints pictures and makes many things with his hands. He plays vigorously and freely, and also acts out stories, imaginary happenings, and bits of real life. He writes poems, stories, and facts and talks of his experiences, real and imaginary, and of other things which interest or delight

him. Each form of expression requires a certain amount of equipment for the best results.

Second: There are the things by which the children will be helped, through actual experimenting and working out problems, to a *first-hand knowledge* of real things. A child watches a caterpillar turn into a butterfly or a tadpole grow its legs, cast off its tail, and become a frog. He visits the post office, factory, farm, and market, the freight yards and docks, and sees with his own eyes the industrial and civic activities which surround him. Again, he tests soil by planting seeds in different kinds of earth and finds out by experiment how much water certain plants and soils need. He tests certain new methods of work, such as making a kite or putting on a wagon wheel. For these and for kindred actions materials of many kinds will be required.

Third: There are the things which will help the children to *second-hand information.* That kind of information is needed for supplementing and checking up their free expression and experimental work and also their first-hand knowledge, which is limited. In order to obtain this information the young investigators examine models and specimens, see pictures — moving pictures and the ordinary kind — and read books. All these requirements must be taken care of in some way.

After thus noting this interaction of method, content, and materials and reminding the reader anew that children learn *through their own activities*, not those of their teacher, we shall proceed to discuss, in *Part One*, the various curricular activities and the materials that are necessary for them.

HELPFUL REFERENCES Books and pamphlets which give helpful information and reports of progressive school work will be found in the Appendix.

CHAPTER TWO

SCIENTIFIC AND SOCIAL ACTIVITIES AND MATERIALS

HISTORY, GEOGRAPHY, SCIENCE, INDUSTRY, APPLIED NUMBER

KINDS

The History-Geography-Science work forms the backbone of the curriculum of the modern school. The kindergarten and the primary child make a beginning in each; and every grade in the elementary school in turn follows up this work.

In the primary grades all these subjects are practically one, with emphasis placed as the case demands, especially when we stay at home in our study. Science is the first to stand out as a separate subject. Daily outdoor life, health habits, the garden, and other immediate contacts, are always the chief features of this work, even when other interests take the children's imagination into the Eskimo igloo of the frozen North, the Indian wigwam of the plains, or the Arab tents amid desert sands.

With the older children the lines of demarcation are more distinct. While there is always a give and take between subjects, grade requirements and other outside factors must be considered. Needless to say, the teacher pulls work together whenever it can be done in a natural way. Forced correlation is always to be avoided.

With the above thoughts kept in mind; with a definite realization that often a given fact may belong to history, geography, or science, according to the emphasis or purpose in presentation; and with the understanding that the statements which follow are neither full nor final definitions, these distinctions are offered.

PLATE I. A SCHOOL CAFETERIA

The Cafeteria lunch hour gives valuable social and practical experiences to the elementary children of the Campus School Maryland (Towson) State Normal School

PLATE II. A PLAY STORE

Planned and used by third-grade children, Springfield, Massachusetts, Public Schools.

VALUES; MEANING

History tells about people: what they do, how they live, what they wear, how they look — all about them. The very young child gets his first real contact with history through actual experience in his own home, family, and community life. Soon also, he learns of people who live in a simple way — Indians, Eskimos, for example, and early Hebrews and Arabs. As he grows older, still other people and other problems of living come into his school study of history; he obtains wider knowledge of his own country's beginnings and growth; of the way people live to-day, both at home and abroad; and he learns something of those early explorers, traders, lawmakers, workers — Phœnicians, Greeks, Romans, Hebrews — of the great craftsmen of the Middle Ages, and of others who have touched very vitally the story of civilization.

Geography sets forth the relation between the place where people live — climate, products, topography and lay of the land — and what they do. Why, for instance, do the down-State people in Eastern North Carolina grow cotton and tobacco, and have many cotton factories, while those of the Western section produce wheat, apples, timber, and vast electric power? Why do the Pacific Northwest and New England have different work, manners, and customs?

Science unfolds to the child some of nature's laws, generalizations, and methods of working, and also how these may be changed or controlled for man's use. This knowledge comes chiefly through close contact with nature and through actually putting her laws in operation. Plants, animals, and the great forces of water, wind, and electricity offer material for observation and experimentation. Nature's laws of health must also be learned and obeyed. The young children form habits of personal care and neatness, and the

older ones develop health purposes, activities, and problems concerning health into civic or social hygiene.

Industry, or the industrial arts, is the actual work of man in utilizing this environment, with its laws and forces, to produce material and conditions which give him aid and comfort him; thus he cooks raw food, weaves cloth from cotton or flax, harnesses steam and electricity to do his work, and so on. Some understanding of, and experience with, these varied processes, which are very simple at first and more complex later on, are most important for children.

Number is not only a science in itself but also, in applied form, an essential factor in all research, invention, and industry.

PURPOSE; METHODS

This interaction between the various subjects should be kept constantly in mind. Since history is often geography, geography, science, and industry all three, and since the different studies require much material in common, some discussion of how to present them seems in order.

Unless the method is carefully chosen the last state may be almost worse than the first, for no materials are entirely proof against a fact-minded teacher. Routine, cut-and-dried lessons with much analysis and memory work, can make anything, however attractive in itself, a deadly bore; it is likely to kill instead of developing intelligent curiosity about things and people. The teacher must hold to one steady aim and purpose. The all-important thing is that the children shall *want* to investigate and shall have the joy and thrill of discovery through their own efforts. Whether a youngster can remember the stages of a frog's growth or glibly name its habits does not matter at all; what

does matter greatly is whether he is sufficiently interested in a frog to make his own aquarium at home, where he can watch the creature develop from a tadpole up. A boy may be able to identify many of the specimens of rock and minerals in the school cabinet, but if he is also capable of sitting idly on a big stone and of taking no interest in it, his knowledge means little to him. The boy who brings a pocketful of rocks to school in order to identify them by that same lot of specimens, is using his information in a most effective way.

Take two groups of children who have been studying by different methods the American Revolution. One group has learned by heart a list of the principal battles of that war, with the names of the general in command, and the outcome of the respective fights. The other group has worked out a project showing the way that people lived, worked, and thought at that time. Then let any layman or teacher estimate the relative value of two methods and the relative thoroughness of the children's achievements. The results of the estimate will be significant. There seems, indeed, no other conclusion to be reached than that the informal, creative method of teaching, when children and instructor work together in a flexible, experimental, coöperative manner, is the only way to use material of the type under discussion.

So then — the elementary school child watches people and their work, investigates such matters as his food, his clothing, and his home surroundings, and then reads or hears of other people, customs, and activities. He watches insects, leaves, trees, flowers, and animals; he examines rocks and earth; he looks at the sky and feels the push of the wind and the urge of running water. He notes characteristics and habits. Then he asks questions, and when possible finds his own answers through further observation or in books — the teacher giving him any necessary help.

The child puts his interest into action. He digs in the

garden and tends growing plants; he collects leaves, stones, seeds, and other nature material. He makes articles that are needed in his work, and in his care of pets and other animals, and does many practical tasks. He paints pictures and keeps records; he gets dyes from roots, bark, and berries. He dams the brook, makes a wind and a water mill, a kite, a sail boat, a weather vane, a sandglass, a sundial. Later he turns to electricity, radio, airplanes, and other instruments for conquering nature's mighty forces.

MATERIALS; EQUIPMENT

The best way to know nature, people, and processes, as has already been suggested, is to see them in their real settings. So the children must go outside of school now and then, to have those experiences which add so greatly to school material and equipment. These trips are possible, however, in only a limited way; opportunities for closer contact and longer study are necessary if the children are really to learn something of the marvelous story of life. Hence, into the school environment must be brought a certain amount of most carefully chosen material. Animals, plants, specimens, a windmill, a weather vane, a compass, and an electric battery belong as rightfully in the school as do books, maps, pictures, pencils, and tablets. Much of this specially selected material and equipment is, as indicated, presented partially or wholly elsewhere. Other materials, especially those for first-hand observation and study and for solving problems, are listed here. All prices are tentative. All addresses are in the Appendix. This classification is followed: A. Animal Materials. B. Plant Materials. C. Physical Science Materials. D. Number Materials. E. Miscellaneous Materials. F. Materials Listed Elsewhere.

Older girls washing school towels, curtains, and aprons

Boys outlining roadway

PLATE III. SOCIAL ACTIVITIES, QUAKER GROVE, NEW JERSEY (RURAL) SCHOOL

Beginning the work on the rear grounds

Planting seeds and flowers near the walkways

After the evergreens and flowers had grown

PLATE IV. SOCIAL ACTIVITIES, QUAKER GROVE, NEW JERSEY (RURAL) SCHOOL

HELPFUL REFERENCES Books and pamphlets which give helpful information and advice will be found in the Appendix.

A. ANIMAL MATERIALS

The study of animal life in the elementary school is chiefly of value if the specimens are alive. Models, stuffed specimens, and certain collections are of use in checking up or supplementing observations, but they are of minor importance here. Actual experience with living creatures of various kinds not only interests children vividly, but also opens up new and fascinating avenues of thought, lays the foundation for future biology work, and even forms the basis for real scientific research — all in an easy, natural way.

To watch a butterfly or a moth creep out of its chrysalis and slowly change from an ugly, sodden thing into a glorious winged creature of color and life; to see a toad change its skin, or a tadpole grow legs, or a speck of gelatin turn into a little graceful fish — any one of these experiences is charged with untold meaning for the small boy or girl. The study of nature takes its proper place, not as a lesson, but as an adventure, and to the patient watcher come thrills greater than even the "movie" can provide.

Taking care of a school pet or animal is another valuable activity. The child finds out the needs and habits of the animal in his charge by reading and observing and so learns many facts; his sense of responsibility is also aroused. Illustrations could be multiplied endlessly.

For these reasons we say that such experiments and experiences should surely have a place in the activities of every elementary school, from kindergarten through the seventh grade. "Mary's lamb" receives a warm welcome from teacher and children alike; no one sees anything funny about a lamb at school. No one squeaks at the toad which appears

from John's pocket, or at the tiny snake which comes apparently from nowhere. On the contrary, every one wants to see the newcomer.

The problem of bringing animals into the school is not great if careful planning and common sense are brought to bear on it. The material needed for this project are the animals themselves and proper equipment for the care and observation of them.

I. ANIMALS

First: The kinds of animals that can be used in school are numerous. Some schools will find the following good material for studying out of doors:

Earthworms; nearly all forms of insect life (especially ants, bees, grasshoppers, crickets, and spiders); frogs, toads, birds, squirrels, and other animals which can be studied as they go freely about their own affairs.

Turtles, chickens, ducks, rabbits, hares, and other animals which must be kept in limited bounds and hence require special houses or yards, and special food.

A sheep, a cow, a pig, a goat, a pony, or some other animal of the spend-the-day variety, which will need no special quarters, only food.

Some wild animal, such as a coon, an opossum, a fox, a weasel, a mole, a muskrat, which needs a secure cage and will stay only a short time.

Indoors the following have proved successful:

Insects (butterflies, moths, crickets, grasshoppers, katydids, ants) which require special cages and boxes.

Water dwellers and small amphibians, such as turtles, snails, mussels, frogs, shellfish, and fishes which will need aquariums.

Small animals (such as squirrels, white mice, guinea pigs, cats, and dogs), also chickens and birds (hen and chicks, a

crow, a blackbird, a pigeon) and perhaps also a few wild birds, for the day only; which will in most cases require cages.

Second: Care in the selection of the animals is most important. Much will depend, of course, upon school conditions, such as the type of room and school yard, and the heating system, and also upon the age and experience of the children. As in the case of so many other projects, a highly successful experiment in one school will prove a failure in another because some of the practical considerations were overlooked. Generally speaking, the lower life forms (insects, frogs, fish) are the easiest to care for, and rabbits, squirrels, guinea pigs, and animals of that kind are best for studying at length. Chickens and pigeons make practical and sturdy subjects.

Third: Sources and prices are usually given with each kind of material. White rabbits, Belgian hares, and guinea pigs can be obtained from any animal or pet shop. Choose the nearest shop.

Fourth: Children should be made to realize that all school animals must have intelligent care. An earnest study of each type of animal and of the food and housing that it will require is essential, no guesswork here. The necessary information can be gathered by the children from people, books, and pamphlets. *Pets for Profit and Pleasure* (Verrill) is excellent for the inexperienced. Nature books and pamphlets give other information.

The natural living conditions of the animals should be reproduced as nearly as possible; this is especially important for obtaining successful life histories of the lower forms, such as insects, frogs, and fish, and for breeding these animals. The cages, houses, and aquariums should be kept scrupulously clean. Any droopy or inactive animal should be

promptly removed. It is unwise to keep any kind of animal — except fish — long.

Fifth: Some suggestions for the use of animals in school have already been noted. Correlation with other work suggests pictorial records (sketches from life and stages of development, as of the frog, the butterfly, and the fish); written records (pp. 137, 145); charming art studies (a rabbit reaching up for food, swimming fish, and so forth); and the work of constructing aquariums, houses for pets, and other requirements, suggestions for which will follow presently.

Sixth: Wild animals should be kept only a short while for observation. The children should feel that prolonged captivity would be cruel, and at the end of a very brief time should set the prisoners free with their own hands, if possible. The predatory or destructive animals should be taken away and disposed of by adults after they have served their purpose.

Seventh: New animals add to the interest and value of study.

II. EQUIPMENT FOR CARE AND OBSERVATION OF ANIMALS

a. Enclosures; Houses

Outdoor enclosures or houses for confining animals must be secure and well adapted to their respective inhabitants. For example, it should be borne in mind when constructing certain houses, that rabbits burrow and chickens fly. The animal should have space for normal movement, a comfortable place for sleeping, and adequate shelter. Further directions are not possible.

b. Bird Houses and Other Needs

Bird houses, feeding stations, and bird baths of the right kind will do much toward attracting and keeping birds in a neighborhood, and the school with any outdoor environment can make effective use of them. The children can be encouraged to care for

birds at home in the same way. Valuable suggestions are found in catalogues of bird equipment: from Dodson's; The Crescent Co.; Winthrop Packard.

1. *Bird Houses*

Children can make bird houses, according to their own designs, to be put up at school or at home for specific birds. They make the houses out of tin cans or out of small boxes of wood — such as chalk and cigar boxes — or of tin. Bark tacked on the outside of a bird house gives it a rustic appearance and makes it especially attractive for use in a tree.

2. *Feeding Stations*

Children make feeding stations by nailing small platforms in trees or other high places or on window sills. In cold climates each station should have a top, three sides, and a floor. If the birds are fed regularly they will learn to gather for their meals at the proper time.

3. *Bird Baths*

A bird bath can be made of cement (p. 69), or a wide shallow pan will serve by itself. The water in the receptacle should not be over an inch deep. Place the bath on a stool or a pedestal, or flat on the ground in an open space where the birds can quickly see and avoid a cat.

c. Cages

1. *Insect Cages* [1]

Insect cages can be made in various ways. Moist sand should be put in the bottom of cage to keep leaves fresh for food.

(*a*) A shoe box with a piece of wire netting over the top will make a good cage for such temporary residents as crickets, caterpillars, and certain other insects.

(*b*) Another good cage for insects can be made from a piece of screen wire, ten or twelve inches high and wide enough to be rolled into a cylinder. Lap the sides about an inch to prevent spreading, and fit a round, shallow cake tin over the top and another over the bottom.

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[1] For fuller description see Hodge: *Nature Study and Life*, and other nature books listed in Appendix.

(*c*) For the larger insects use a wooden frame without a bottom. Cover it with screen wire, and fit it over a board, a pan, or part of an aquarium.

(*d*) Glass jars (a large fruit jar will do) are good receptacles for breeding insects. Use net to cover the top, and fasten it with a strong rubber band.

(*e*) A good permanent breeding and rearing cage for crickets, katydids, or grasshoppers is made by setting a lamp chimney in a small pot of earth in which grass or clover has been planted. Press the chimney firmly into the soil and cover its top with a net fastened on with a rubber band. Keep the pot in a sunny window in a saucer that is filled with water. A number of insects at a time should be kept in the cage, and they should be changed until both sexes are represented. One male to several females is a good proportion.

(*f*) *Ant cages* can be made, but they are not likely to be satisfactory. The best arrangement for observing ants is made as follows. Push a piece of glass down several inches in the middle of a large ant hill and leave it there for a day or so; then excavate on one side of the glass — whereupon underground chambers, passages, and pupæ on the other side of the glass can be plainly seen.

2. *Observation Bee Hive*

An observation bee hive, an object of great interest to all children, is practical for most schools if it is kept in a window that does not open on the playground.

(*a*) Observation hives made especially for school purposes can be purchased (A. I. Root Co.) for $10 (weight 25 pounds). Buying them in this way is strongly advised. Write for catalogue and instructions.

(*b*) An ordinary hive of small size can be modified for school use in the following way:[1]

(1) Insert pane of glass on each side for purposes of observation. Put on hinged shutters to keep the hive dark when it is not under observation, since bees object to light.

(2) Place the hive inside the classroom on the shelf of a window which does not open on the playground. Lift the sash

[1] For fuller description see Hodge: *Nature Study and Life*, and other nature books listed in Appendix.

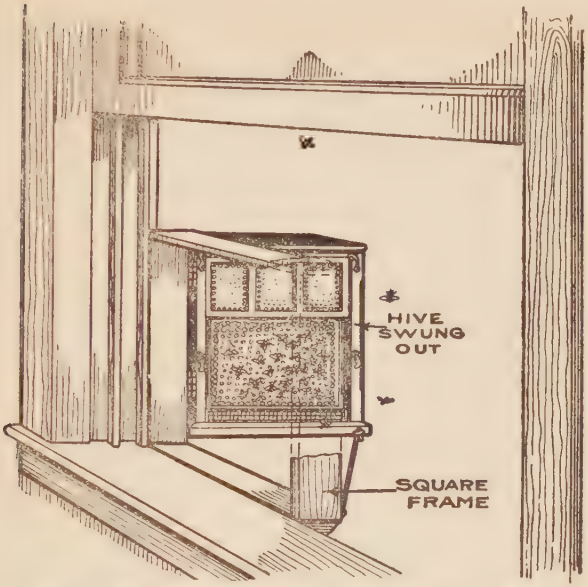


FIG. 1. OBSERVATION BEE HIVE IN CLASSROOM WINDOW

about two inches and insert a strip of wood that will close the opening except in front of the entrance to the hive. Make a covered passageway from the entrance to outside the window sill, so that no bee can get into the classroom. When it is time for observing bees at their work, open the shutters of the hive.

(*c*) For books on the care of bees write to the Department of Agriculture, United States Government, Washington.

3. *Cages for Small Animals or Birds*

Cages for animal visitors in the schoolroom (birds, guinea pigs, rabbits, squirrels), are often necessary, especially in the primary department. Each school should have one or two.

(*a*) A convenient cage is about 30 inches long, 20 inches wide, and 18 inches high, and is in two parts which hook together. The top part is a wooden frame covered with strong screen wire of large mesh (one-half inch) or with chicken wire of three-fourths inch

mesh. There is a trapdoor in the ceiling. The bottom consists of a movable zinc tray, made by a tinner, about 3 inches deep, and water tight to protect floor, table, or shelf. Two such trays are desirable for each cage. Keep the cage on a low table or on saw horses, sufficiently far from the wall to allow all the children to stand around it.

(*b*) A larger cage ($3 \times 4 \times 6$ feet) on castors, has a zinc-lined bottom and a good-size door with a secure latch.

d. AQUARIUMS

Aquariums are essential in school science or nature work, and may be of glass, cement, tin, zinc, or crockery. They can be purchased or made locally, or various substitutes can be used.

A glass aquarium holding from two to four gallons can be bought from a mail order firm, a department store, or a science supply firm for a price between $7 and $9. It can be made much more cheaply by a local carpenter or glazier. $12 \times 12 \times 24$ inches is a good size for an aquarium. The sides are made of plate glass a quarter of an inch thick, and are channeled into slate at the bottom and finished with lead corners and coping.

A large flint glass battery jar (tall cylinder) costs from 75 cents to $2 from the Central Scientific Co.; the Chicago Apparatus Co.

Cement aquariums can be made by the older children (p. 69). These are heavy and so will require a strong foundation or else must be placed on the floor. When a large floor aquarium is used, some method of drainage from the bottom must be planned.

A *galvanized laundry tub*, painted on the outside with automobile paint, can be used for an aquarium — also for water play (p. 196). Large shallow *butter crocks* make good aquariums; *glass jars* serve temporary needs; so do pans of many different sizes. *Zinc trays* of any size can be made by local workmen.

These various kinds of aquariums can be used for frogs, fish, tadpoles, turtles, snails, water insects, small alligators, and plants.

The children can collect all of these specimens, except goldfish, from ponds, streams, and swamps. The element of surprise which enters into keeping an aquarium is delightful as well as educative.

Necessary purchases can be made from John Wanamaker; A. Catchpole, naturalist; The New York Aquarium Co.; Ward's Natural Science Institute; or any local bird or seed store. The

fish cost from five to fifteen cents each, the snails about five cents each, and the water plants from ten to fifteen cents each.

1. *General Aquarium*

A most attractive and interesting aquarium contains several kinds of fish, all about the same size — goldfish, minnows, sunfish, roaches, shiners, and suckers, all living together peaceably — and snails and tadpoles. It should also contain plants, especially tape grass and arrowhead. The snails and tadpoles act as scavengers and keep the water clean, and the plants give off oxygen for the fish and use the gas that the fish exhale; so a well-balanced aquarium needs them all. *Class Room Aquaria* (the Lincoln School of Teachers College) gives full plans for aquariums. The following suggestions are culled from it:

(*a*) Have the aquarium of glass, if possible, of oblong shape, and as large as possible, since fish need exercise and like a long, straight run. A galvanized iron tub, three feet in diameter or smaller, or a large cement aquarium could be used instead.

(*b*) Place in an aquarium holding from three to fifteen gallons of water, one or more sprays of arrowhead or of tape grass, three or four large snails, and two or three tadpoles. One gallon of water for every inch of fish is a good proportion.

(*c*) Make the aquarium more attractive by plants and a small rockery. Rockeries make attractive additions; they can be purchased, or the children can make them by piling up small stones.

(*d*) Keep the aquarium always in good condition.

The children should do the work of cleaning as often as it is necessary. Dust, algæ, surplus food, and other trash should never be allowed to remain in the water. When the water is sour or milky a thorough cleaning is needed.

(*e*) Place the receptacle in winter where the sun will shine on it for two hours daily, and in hot weather keep it out of the direct sunshine.

(*f*) Feed fish daily and at regular times, with small quantities. A good mouthful or two for each fish is enough, though a little more will be needed if the aquarium is large and the fish consequently get more exercise.

The food should consist of raw beef, raw fish, the larvæ of mosquitoes, baked white potato, the yolks of hard-boiled eggs,

ant eggs and prepared fish foods. The fish foods are the most convenient to use and cost very little at any drug, fish, or bird store.

2. *Tadpole Aquarium*[1]

A crock, a deep pan, or a glass jar will serve for this.

(*a*) Place in the receptacle some stones from a pond. Set them in such a way that one side of the aquarium will be built up higher than the other, and that a stone or two will project above the water. Be careful not to disturb the growth on the stones.

(*b*) Add plants, mud, and then water from the pond; then put in the tadpoles, about twelve to a gallon of water.

(*c*) Renew the water from time to time — for it evaporates — with more pond water; and also add now and then a little mud and fresh stones in order to keep the conditions well regulated.

(*d*) Feed tadpoles bits of hard-boiled egg or cooked corn meal.

(*e*) Keep their aquarium out of the direct rays of the sun.

3. *Water Insect Aquarium*[1]

Any glass jar will do. Put into it a layer of sand about an inch deep, and set water plants in the sand. Next put down a layer of small stones or of gravel and pour in water from a pond or stream. Then put the insects in.

4. *A Toad or Frog Aquarium*[1]

A glass jar with a layer of stones or gravel in the bottom covered with thick moss, makes a comfortable temporary home for a frog or a toad. Drench the moss and gravel with water daily and keep the jar in the shade. Frogs eat flies, grasshoppers, and other living food.

5. *Aquarium for Turtles, Frogs, Crawfish, and other Water Life*[1]

For this use a zinc or galvanized iron tray 2×3 feet in size (or of any surface measurement desired) and at least 5 inches deep. Cover the tray with a wire screen that stands three inches higher than the tray and fits closely over the top to keep the guests within bounds. A tinner can make it.

Fill one end of the tray with earth or sand, stones, moss, and

[1] For fuller description see Hodge: *Nature Study and Life*, and other nature books listed in Appendix.

such material, built up in such a way as to be higher than the water. Then add the water, which should come, if possible, from a pond or stream. Later on the tray will serve as a sand pan (p. 38).

e. NETS

Both air and water nets are needed by older children for catching specimens and for holding fish and other aquarium material. They are easy to make or can be bought.

(*a*) If they are to be bought, purchase from the A. I. Root Company or from scientific supply firms. Air net (12-inch) about $1.50. Water net (5-inch) about $1.

(*b*) If the children make them, they should follow the directions given in Farm Bulletin 606, Department of Agriculture.

B. PLANT MATERIALS

Real experiences with plant materials, also, have an important place in school work.

To dig in the earth, and plant hard, lifeless seeds or bulbs, or leafless cuttings, to watch the first shoot push through to the air and light, to water and care for the growing plants, and finally to gather a harvest of bright flowers, ripe vegetables, and mature grains, is a general education in itself. The children's work will be successful if even a few of the possibilities are followed.

To watch a tree make its entire cycle from full leaf to full leaf again, passing through the various stages of bare branches, delicate green film, rich greenery, and scarlet and gold decoration, is a wonderful experience, too, and so are many other happenings which the child at school can observe.

At school, then, children should be encouraged to follow the changing seasons; to tend growing things indoors and out; to make interesting experiments in germination and growth; to collect and arrange seeds, leaves, and grasses; and also to learn to recognize some of the common trees and flowers, and certain of the more important industrial plants.

For all this both plant materials and the equipment for their use, will be needed.

I. PLANTS

First: The variety of plant materials that is available seems endless. There are seeds, root, plants, cuttings, bulbs, and saplings, for planting and experimentation. There are flowers, grasses, burrs, and many seeds to be had, in all stages, from the gardens, fields, and woods. Twigs and branches of trees and shrubs show leaf buds, hard and rainproof, swelling with spring growth or opening into new leaves. They also indicate yearly growth and show other interesting processes. There are green, colored, and brown leaves and bits of bark and sections of wood from the trees — all useful in showing the different stages and characteristics of tree development. There are tiny water growths and there are beautiful water plants such as the water-lily, the iris, and the cat-tail which tell their own story of adaption to environment, as do the dry cactus, the tumbleweed, and other desert plants. Air plants, mosses, lichens, and various kinds of fungus growth all furnish some interesting features for school work.

Second: The selection of material to be used with a special group of children depends largely upon what is available. A full, rich experience with as many types of plants as possible should be planned. The children should be encouraged to help choose and bring in specimens.

Third: The different sources of all these materials are partly suggested by the very nature of the materials themselves. This kind of equipment can be obtained by purchasing, exchange, or collecting. Sometimes gifts add to the stock. Home gardens, school gardens, and farms; near-by woods and fields; ponds, brooks, and other water

sources all contribute delightful materials. Children or communities can share special products with a distant group through exchange or in response to a written request. Civic or educational organizations of town, state, or nation will frequently aid with seeds, cuttings, and plants. Garden magazines which encourage garden plans are likely to prove helpful. Dealers in seeds and shrubs (see advertisements in garden magazines) frequently give discounts to schools.

Fourth: Plants, like animals, need a normal environment and watchful attention, and the proper soils to be used, the amount of water that will be needed and other points should be studied with great care.

Fifth: Plans for use are fully covered in the introduction to this section, or with each material, or in the books or pamphlets that are listed.

II. WORK EQUIPMENT AND USE

a. For Gardening

Every school needs a real garden, however small. A large space with room for individual as well as for group plots is ideal, but even a tiny place is better than none. Where the space is very small, the children should be encouraged to have their individual gardens at home and do only group work at the school.

All garden plans must be carefully made, with time, expense, available space, vacation care, special school problems, and many other points taken into consideration.

The younger children plant flowers and quickly maturing vegetables, which they take home later, or use for school decorations (p. 163), picnic parties, or luncheons. The older children grow industrial plants (cotton, flax, corn, wheat, rye) for experimental or illustrative purposes and also work with soil, insects, and other agricultural material.

All garden equipment should be kept together in a garden tool house, a basement, or a classroom cupboard — never left out of doors or in the halls. (See Where to Keep Equipment, pp. 326–337.)

A long work period twice a week is better than a short daily period. It takes time to put on hats, gather up tools, and go to work. Unless the garden is large, only one group should go out at a time — hence a work schedule is needed.

In group work turn about is the rule. If there are not enough tools or tasks to go round, the children who are not busy with the garden should have other things to do, such as cleaning up the yard, caring for the pets, cleaning erasers, and so forth, or they may play games. They should not be allowed to run around idly or make any disturbance, for that will disturb the other groups. Detailed help for the teacher can be had from the Bureau of Education and Department of Agriculture. Write for bulletins, stating any definite need.

1. *Tools*

Tools should be of good quality, never toys or cheap articles; they should be kept clean and sharp.

(*a*) Tools can be bought from local hardware stores or from mail-order houses. Investigate prices. Small weeders and trowels can sometimes be found at a ten cent store, but they are not likely to stand hard work. Sometimes old broken tools of good grade will be donated to the school; this material, mended or sharpened, as necessary, will give excellent service.

(*b*) The number and kinds of tools needed will depend upon the storage space, the size of the garden, the number of children who work at one time, and the amount of time assigned to garden work. Each group should, if possible, have its own set of tools. But with care and under a well-arranged schedule, the primary grades may use the same set. The upper grades, also, may share a set.

(1) In purchasing garden tools it is very much better not to get too many at once or to follow exactly any specific list. A good plan is to begin with a few rakes and hoes and trowels and add other tools as needed or as the money for them is forthcoming.

(2) The younger children should use the lightest weight regulation tools with the handles cut off to suit the largest children who are to use these. Measure carefully, testing with sticks of different length before cutting the handles. The older children use heavier tools.

(3) This list is suggested for a class of forty children, working in two groups of twenty each. It may be greatly reduced if necessary. 2 to 6 rakes, 4 to 6 hoes (sharp points), 4 to 6 hoes (square points), 6 to 12 trowels, 1 fork, 6 to 12 weeders, 1 spade.

2. *Measures* (pp. 31, 34)

The following instruments for measuring will be needed by each group for marking off plots, walks, and the distances between rows or plants:

(*a*) 4 yardsticks (p. 278), bought or else made by the children out of lathes marked off in inches or feet.

(*b*) Tape on a reel, 60 feet in length, to be obtained from a hardware store or a mail-order house. Price, 75 cents.

3. *String*

A ball of strong cord (not twine) is also needed to straighten lines and check off plots. After the cord has been used it should be washed and rewound on the ball for future use. Wax or oil the cord well to strengthen it and prevent its soiling.

4. *Markers*

Markers can be made by the children from thin wood (chalk boxes will do), with each strip sharpened at one end and painted with oil paint. They are often needed, and they add to the attractiveness of the garden.

5. *Hose*

A hose, with a reel for winding, which will reach from the hydrant to any part of the garden, is important where there are water connections. If more than fifty feet long, it should be in two sections. A spray attachment is desirable. Each group should have its own nozzle. After the hose has been used it should always be wound on the reel.

6. *Sprayer*

A small hand sprayer is convenient for outdoor as well as indoor work. A tin sprayer that will hold one quart or two pounds of spray costs 50 cents; a brass one $1.50 (Hammett). They can also be purchased at hardware stores or from mail-order houses. Use any mixture that may be needed.

7. *File-Paddle*

(*a*) A broad, flat, coarse file costs about 20 cents and is needed for sharpening garden tools. A sharp-edged paddle that any child can make is used to scrape the dirt from tools.

8. *Cold Frames and Hot Beds*

Full directions for outdoor cold frames and hot beds are in Farmers Bulletins 934, 936 and 937, and in *Gardening Instructions for Club Members*, from United States Department of Agriculture, Department Circular 27.

9. *Boxes for Seedlings*

Seedlings that are easy to transplant are grown indoors in eggshells or in paper boxes. Plant one seed in receptacle, keep well watered and when the shoot is large enough plant it in the ground.

b. For Other Plant Work

Experiences with growing things in the schoolhouses are also practicable. Raising bulbs and potted plants, making experiments in germination growth in relation to soil, the study of moisture, of heat and cold, and leaf and stem development, as well as other interesting work can be carried out with the crudest equipment. Other kinds of work will require a school greenhouse. For all growing plants watchfulness will be necessary and various appliances will be required. They must also be protected in some way against insect enemies.

1. *Window Boxes* (p. 163)

Window boxes for use inside (movable) and outside (fixed) are very attractive if kept in good condition. Ferns, vines, and bulbs are the growths that can be used most successfully; begonias grow well; parsley, lettuce, mustard, and radishes can be grown. Rye and millet germinate quickly and show early the first stage of growth.

(*a*) These boxes, of wood or zinc, can be made at school or by a carpenter. About eighteen inches high by nine inches wide, and any required length, are satisfactory dimensions.

(*b*) Self-watering boxes can be purchased at a hardware store or from mail-order or nature or science supply houses. "Savo" (Dodson) is a good box, $3, $4, $5 in price, according to length.

2. *Pots; Jars*

Flowerpots of many sizes (tin cans will do) and jars and vases (see Art, p. 164) are needed.

3. *Germinators*

(*a*) A box which will serve this purpose temporarily is made of two small strips of glass held apart by narrow wooden ends. A chalk box or other small box will also serve after a strip of glass has been substituted for one side.

(*b*) A tumbler or tall slender marmalade glass will do very well for a germinator.

(*c*) Fill any of these containers with soil or with sawdust, plant the seeds close to the glass, and cover the glass with opaque paper so that the seeds will have a chance to sprout. Another kind of germinator is made by putting moist cotton between two sheets of glass.

4. *Greenhouse*

Directions for a school greenhouse can be obtained from the Department of Agriculture or the Bureau of Education.

5. *Watering Appliances*

(*a*) A small watering can costs about 75 cents at a hardware store or from a mail-order or a science-supply firm.

(*b*) A tin bucket or can with holes in the bottom will serve the purpose.

(*c*) Also a bath spray attached to a faucet, where there is running water. This is excellent.

(*d*) A hose (p. 25) is essential for garden as well as for other use, where running water is to be had.

C. PHYSICAL SCIENCE MATERIALS

The modern school, even in the lower grades, finds much of interest and value in dealing in a concrete way with certain phases of physical science. Such forces as wind, water, and electricity, the properties of coal, iron, and other materials, and measurements of time, space, heat, and light, become for the child, through practical use and experiment, far more than abstract ideas.

To dam a brook or make a water wheel, set up a wind mill or a weather vane, sail a boat or fly a kite, put in a radio, or electrify a doll's house, is to understand and apply, at least in a small measure, one of the great forces of nature which play so tremendous a part in man's development.

Using a compass on a field trip; playing with a magnet or a compass; watching a kettle boil, a pendulum swing, a sand-glass slowly empty itself; noting the effect of cold and frost; draining the water from an aquarium by gravity — all this involves acquaintance with still other forces and with the laws and principles by which they operate.

Collecting specimens of minerals and rocks means learning how these substances are made and their uses and qualities, and also gives new insight into nature's method of working. Here again the illustrations and possibilities are almost endless.

These problems should be noted:

First: There is no clear-cut age limit in any of this work — everything depends upon conditions. The method to be used is the most important thing.

The children in the primary grades are concerned chiefly with the activity and its result. The older children, especially those in the sixth and seventh grades, are interested in, and can understand, something of causes and processes. The primary groups merely build a dam or make a water wheel; the others, doing the same kind of work, learn why the force of the water is increased and something about the laws of gravity. Practically all this material ties up with other school work — arithmetic, English, history — and a free use of the index is advised.

Second: The selection of this material also depends upon the individual case. The following list will be of general interest in practically all elementary school grades.

a. Time Apparatus

1. *Calendar* (see pp. 34, 279)

2. *Clock* (see pp. 34, 280)

3. *Stop Watches*

Stop watches for games and field work, as well as for certain kinds of science work, are often needed. The following come from the Chicago Apparatus Company or can be procured from other science-supply firms.

Single Action Type for accurately timing a single performance; standard make, $15.

Double Action Type for timing two events which start at the same time but end at different times, $33.

4. *Sundial*

A sundial in school grounds is an object of interest, illustrates one phase of time-keeping, and gives opportunity for arithmetic work (p. 34).

(*a*) The dial and gnomon, with full directions for setting up, can be purchased, and the base can be made by the children out of cement (p. 69), rock, or wood as desired. The base should always be of artistic shape, and it should be placed where the sun can strike the dial at all hours of the day. An excellent dial (without base) comes from the Chicago Apparatus Company, price, $8.50.

(*b*) Sundial demonstration forms of cardboard (F. 773) come at $1.25 the dozen, from the Central Scientific Co. The children will use these in making the dial and gnomon.

5. *Time Glasses*

(*a*) Time glasses (with hour, minute, or any other time measurement desired) can be constructed by the children out of bottles, small boxes, or other material.

(*b*) These glasses can also be purchased for a few cents each at the ten cent store (egg timers), and also from hardware stores, mail-order houses and science-supply firms.

b. Weather, Wind, Heat, and Cold Apparatus

1. *Barometers*

A barometer for weather observations, filled ready for use, costs $7.50 from The Chicago Apparatus Company. The older

children can also make one (see Hodge: *Nature Study and Life*), but this work is rather complicated.

2. *Thermometers*

(*a*) Thermometers to register air temperature (p. 269) are essential.

(*b*) Thermometers for other purposes cost about as follows: dairy, 75 cents; soil (bottled) $2.25; cooking, 75 cents to $1.25. They can be obtained from The Chicago Apparatus Company, hardware stores, and mail-order houses.

3. *Weather Vanes*

(*a*) A weather vane for daily weather observations by all the grades is easily made by older children, who work out mechanism as a problem. An arrow, bird, or other form cut from thin wood or tin, painted, and securely fastened on a pivot (nail or peg) so it will turn easily, is all that is needed. The vane should be mounted in an exposed place, at sufficient height to catch all the winds.

(*b*) Weather vanes can be bought from science-supply firms mentioned above. Investigate prices.

c. Light Apparatus

1. *Prism*

A prism is of interest to children, the younger ones enjoying its color and movement, the older ones gaining help in the study of color and light.

(*a*) Prisms can be had from school-supply and science-supply firms in many sizes at various prices.

(*b*) A prismatic glass pendant from an old chandelier will serve.

d. Weights and Measures

1. *Scales*

(*a*) *Large Scales* (p. 269) for weighing the children can be used also for other purposes.

(*b*) *Small Swinging Scales* can be made by the children (from the third grade up). Each pair is composed of a balance bar, two baskets suspended by a string exactly in the middle of the bar, and weights 1 ounce, 2 ounces, 3 ounces, one-half pound, 1 pound, made of small bags filled with sand or with shot. These

scales provide excellent drill in arithmetic (p. 35) besides some instruction in physics, and are used for play and for real weighing of such material as ingredients for cooking, dyeing, and making paste.

(*c*) *Small Scales*, preferably with a base, can also be purchased from hardware or mail-order firms, price $1.50 up.

2. *Linear Measures*

Yardstick (pp. 25, 278), tape measure (pp. 25, 129), and rulers (pp. 34, 125), accurately made and marked, are most essential for practical school work. It is necessary that children learn early to use these accurately, for out of measuring comes computing and estimating, as well as correct workmanship.

3. *Wet and Dry Measures*

Teaspoon, tablespoon, pint, quart, gallon, peck, and perhaps bushel measures are often needed. Cooking, work in cement and clay, making paste, dyeing cloth or paper, and many other real as well as play activities require the making of careful measurements. The use of measures soon causes a demand for tables and other phases of arithmetic for computing (p. 34). The stock of measures can be purchased complete or in part, or adapted or collected by the children, as seems best.

(*a*) A cabinet containing a full set of all measures can be purchased from any school-supply house, but it is expensive. Some of the articles (measuring spoons and pint and quart cups) can be purchased from ten cent stores.

(*b*) Collecting or adapting by the children is possible in many cases.

(1) Spoons and measuring cups will often be donated from the home.

(2) Baskets, glass jars, tins, and other containers can be carefully measured and accurately marked according to real measures, and thus made serviceable.

e. Force (Water, Steam, Fire, Electricity, Magnetism, Wind)

1. *Compass*

A mariner's or magnetic compass is a good instrument to use with the older children on field trips, also for illustrating physical geography work. 53M is recommended, to be had at about 90

cents from The Chicago Apparatus Company. Other compasses (38M) cost 28, 40, and 50 cents according to size, and will serve.

2. *Magnets*

Magnets, aside from their interest to children, are very instructive in showing the power of attraction. They are often to be found at the ten cent store. Larger and stronger ones can be obtained from The Chicago Apparatus Company (83M) at 25 and 35 cents. 33M is a breaking magnet (four pieces) and costs 35 cents. A loadstone (118M), or natural magnet (large specimen of magnetic iron ore), costs 50 cents from same firm.

3. *Electrical Equipment* (upper grades only)

Only a small amount of electrical equipment is needed for the elementary school. The children can learn to wire a doll house, repair an electric cord, and change fuses (they should not have wet hands or stand on a damp floor when handling fuses), wire and connect an electric bell, and set up a radio. A small electric motor (dry cell 2 to 4 volts), some wire, and an electric bell are probably sufficient material for this work unless there is a special science teacher. Often the children will bring this in as well as electric toys to be shown to others.

All kinds of electrical equipment, including that for radio, can be had from such firms as the Central Scientific Company, and the Chicago Apparatus Company. Much also comes from mail-order firms, ten cent stores and local shops. State your need and if in doubt ask for advice in selection.

4. *Steam Equipment*

Some means of boiling water, and a bottle with a loose-fitting stopper to hold the water are all that are needed in the elementary school to show the power of steam.

5. *Kites; Sail Boats; Weather Vanes* (p. 30)

These, made and used by the children, show clearly to even the youngest the driving, pulling force of wind. See Appendix for helpful books.

D. APPLIED NUMBER MATERIALS

Numbers and their various combinations play an important part in daily living and also in scientific research, there-

fore a knowledge of how to use them accurately and intelligently, as the need arises, is very necessary. How to train children in this skill is an important problem in the elementary school. A few suggestions follow:

First: Arithmetic work in the Elementary School should, wherever it is possible, grow out of real experiences in work and play. The closer the connection between number work and other school or life activities, the more definite and clear is the child's understanding of it.

To measure plant growth, handwork material, and food material; to estimate quantities and prices; to regulate the room temperature; to weigh one's self and keep the record of gain or loss; to select and pay for one's lunch in the cafeteria; to conduct a school bank, a sale, or a supply store — all this involves learning to use and to understand number processes and combinations. It is soon obvious to the children that careful drills and the use of tables will make the task easier.

Second: Drill or memory work should come when needed, after the basic principle in the special process is clear to the child through use. Tables and rules should be accurately memorized until they are really automatic and available for quick service. Only those that are used frequently should be chosen for memorizing.

Third: The method of teaching should be informal with small children, and with all children as natural as possible. Certain devices such as artificial stimulation through the teacher's voice or manner, prizes, stars, honor rolls, and games often take the attention from the real purpose and blur the fundamental idea, especially with little children. These devices are not really needed when there are so many practical, simple methods which will give much better results.

Games planned especially to teach number are usually

artificial and unpsychological (p. 173); plain drill is to be preferred. There are, however, real games of much vitality which offer as a by-product some very helpful number ideas and good training in certain processes — especially addition. These are usually score games of different kinds. A few which require simple equipment are listed elsewhere (p. 197). There should be no formal number work in the first grade and little in the second. Tables should be used with the older children only.

Fourth: Practically all material for teaching arithmetic (except that for formal or drill work) belongs to some other school activity, the correlation being perfectly natural and quite obvious. A few definite suggestions are given; the teacher will supply many others.

a. Calendar (p. 279)

A large calendar is needed for both practical and social purposes, such as making the work schedule, plans for present and future activities, keeping records, and so forth. It is important to know how to use this calendar. Reading numbers, division into 7's, connecting the date of the day with the name (as, Wednesday, 6), and other similar problems are plainly arithmetic work.

b. Clock (p. 280)

Ability to tell time correctly is a necessary accomplishment. Learning to do this accurately involves excellent training in arithmetic for primary children. It involves counting by 5's to 60, adding 5's, dividing 60 into 5's or 5's into 1's, using the terms half and quarter, and reading numbers, Roman and plain. Making a sundial (p. 29) for the garden or a sandglass (p. 29), will also give practice in arithmetic.

c. Measures and Weights

1. *Measures*

Measures of all kinds — wet and dry (p. 31), linear (pp. 31, 135) — are as essential to good teaching in arithmetic as to carrying out practical work.

2. *Scales* (pp. 30, 269)

Scales are needed for many purposes both in school and out. Weighing things correctly involves reading numbers, counting 5's and 10's, adding, and carrying through other processes that call for the use of numbers.

d. Thermometer (pp. 30, 269)

Knowledge of how to use the thermometer, which comprises reading numbers, counting by 10's to 100, and by 2's to 100, adding, and subtracting, is important both in studying science and in other connections.

That the room should be kept at 68°, that flowers and seedlings and bulbs placed for root-making require special temperatures, that the mercury gives helpful hints as to developments in the weather, and many other useful facts make acquaintance with a thermometer necessary or well worth while. Cooking, the baby's health, and other matters, also call for skill in handling and reading this instrument.

e. School Savings Bank

This is an excellent school activity for use in teaching arithmetic in the upper grades, if it is carefully organized and supervised by a teacher, who will take care of the money and be responsible for the project. The requirements are a money box, real check books, and deposit slips printed for the school. The arithmetic period may be used for banking hours — for receiving deposits and cashing checks. Accounts are kept and balanced and statements sent out, different children taking part in the work. The money is kept in a real bank, and the deposits are made by the school bankers. Visits to the bank to see banking methods, vaults, and adding machines are part of the plan. Advice is also given to the children by bank clerks and cashiers.

f. School Supply Store

This is another valuable social activity for older children, especially related to arithmetic and also very convenient in its application, especially in a rural school. At the store school supplies such as pencils, crayons, ink, tablets, and other material (none perishable or easily damaged) are kept and sold at a small advance over wholesale cost. The equipment used, in addition to the

regular stock, includes cash for making change, a cash box with a lock, suitable containers for the stock to prevent soil, damage or loss, and a good cupboard with a lock, — mouse proof, if necessary. One grade usually takes charge. The store is kept open at certain hours just before or after school, or at noon, with child shopkeepers in charge. The stock must be frequently checked up. The money received is deposited in a real bank, and all bills are paid by check. The surplus is used for the school or as desired.

g. School Cafeteria or Lunch

A school cafeteria (p. 283) offers the older children who conduct it, and the younger ones who purchase the food, a real opportunity for training in arithmetic. This is fully covered in pamphlets on these activities.

h. Drill Materials

Some drill material may be used after children feel the need of it and see the reason for it, though the teacher should always remember that the best "drill" is the practical use of the method or material day after day.

1. *Free or School-Made Materials*

(*a*) *Number cards* made in a number of ways from large calendar figures or with stamp-printing outfit (p. 275) are used in the primary grades. These are 6×9 inches in size for flash cards and smaller in size for seat work.

(*b*) *Large calendar figures;* cut out and used by the children in many ways for matching, combining, or arranging.

(*c*) *Puzzles* for seat work; copied from bought puzzles.

(*d*) *Counters* for small children; pebbles, melon seeds, corn, beans, toothpicks.

2. *Ready-Made Drill Materials*

Ready-made drill material is improving in quality, and comes from any school supply house. The teacher selects to meet her need. The following kinds are suggested by a progressive primary supervisor who has made a special study of this topic. Other kinds may be added.

(*a*) Arithmetic Seatwork. Published by The Harter School Supply Company.

No. 2067 The Grocery Story — 3d Grade
No. 2071 The Toy Store — 3d Grade

(*b*) Harter's Self-Sorting Seatwork for Primary Grades. Published by The Harter School Supply Company.

No. 2026 The Silent Teacher of Addition — 2d and 3d Grades
No. 2032 The Silent Teacher of Subtraction — 2d and 3d Grades
No. 2033 The Silent Teacher of Multiplication — 3d Grade
No. 2034 The Silent Teacher of Division — 3d Grade

(*c*) Number Puzzles of all kinds from any toy or school-supply firm make good drill material.

3. *Self-Teaching Materials*

"Self-Teaching" arithmetic materials worked out in the well-known Winnetka, Illinois, Public Schools, are now available in part. Others will soon be added. Investigate.

(*a*) Washburne Individual Arithmetic Cards for grades 1, 2, 3. Published by the Plymouth Press.

(*b*) Washburne Individual Arithmetics, with practice materials for grades 1 to 6. Published by the World Book Company.

E. MISCELLANEOUS MATERIALS

There is a great deal of material which serves various phases of the work in history, geography, science and industrial art.

a. Magnifying Glasses

Magnifying glasses, to be used for work in all grades, add greatly to the interest and accuracy of certain observations. They also stimulate investigation and curiosity as to how many things are made. The glasses can be bought from J. L. Hammett; mail-order firms; The Chicago Apparatus Company; Bausch and Lomb.

1. *Small Tripod Magnifiers*

A one-inch lens costs about 75 cents. Several of them will be

desired — two at least; six or more if possible. Keep them within easy reach and encourage the children to use them for examining material brought in from excursions: mosses, leaves, insects, the bark of trees, and also such compositions as paper, cement, and cloth.

2. *Reading Glass*

A reading glass with a $3\frac{1}{2}$- or 4-inch lens costs about $2.75. Each group should have one, if possible. This glass shows larger areas than the ordinary magnifying glass; the children can see, for example, a whole butterfly or moth enlarged, or a frog's back.

3. *Microscopes*

Microscopes are not needed, as a rule, in elementary schools, and can be borrowed from a high-school laboratory for some kinds of special work. They can be had from any science-supply firm but are very expensive.

b. Boxes; Pans; Trays; Sand Table

These are often needed for temporary aquariums (p. 20), experiments with plants (germination, effect of heat and of cold, and so forth), and for illustrative work in history and geography (sand maps and small representations, or "set ups").

1. *Boxes* (p. 62)

Shallow wooden boxes, sandpapered smooth and treated with a coat of spar varnish will serve — and cardboard boxes temporarily — for many of the above purposes.

2. *Pans*

Old baking pans can be brought from home by the children and painted to prevent their rusting.

3. *Trays*

A zinc tray, four to six inches deep, just fitting the window sill, can be made by a plumber or a tinner, and will prove very useful. Other zinc trays, too, are used.

4. *Sand Table and Spray*

A sand table (sand pan or outdoor sand pile will serve) with a spray or watering can is useful for showing the effect of rain and streams on land (erosion, land building).

c. Maps; Globes; Charts

Maps, globes, charts, and other printed formal materials have a valuable place in the teaching of history, geography, and science if they are not used too early or too often and if properly read or interpreted.

1. *Maps*

Maps for the elementary school, whether school made or published, should be of physical, social, or industrial nature: the political maps, showing only boundaries and locations are of little or no value. There have been great changes in the method of using maps of late and most interesting new plans and ideas are now being developed in Departments of Education and of Geography in many universities. The work of Barrows and Parker (the University of Chicago) is especially worthy of note. Teachers of upper grades are urged to keep in touch with progressive courses of study and other modern developments along these lines. (See Appendix.)

(*a*) *School-made maps* are of many kinds, serve many purposes and are made of many materials.

(1) *Pictorial maps* offer excellent opportunities for both group and individual work with older children. Really beautiful maps have been produced in some schools and the themes may be imaginary as well as practical and realistic. Color is essential. All the earlier maps of exploration and travel were of this type with miniature pictures of ships, houses, or other objects used instead of the dots or symbols of the modern map. It is usually best to show the children a printed pictorial map (see Printed Maps) before they attempt to make one. For the group map a large heavy piece of paper (4×6 feet, if possible) — with boundaries or general outlines drawn in heavy lines — is tacked to the wall. The children color the larger spaces of land and water with tempora colors (p. 112), calcimine (p. 66), or dye (p.79) and plan the definite placing of the pictures. They then draw, paint, cut, and paste in place the tiny ships, houses, trees, walls, animals, castles, or other desidera as the plans indicate. Names or descriptions are printed on last. The individual map is made on a smaller piece of paper (24×36 inches), by one or two children, in the same way.

(2) *Product maps* (that is, maps with tiny sections of

cotton, wheat, and other real material fastened on) are too familiar to need further mention.

(3) *Relief maps* (maps of hills, valleys, rivers, and plains) are made by the sixth-grade children of clay (p. 71), of salt and flour mixture (p. 72), or of paper pulp (p. 103). They model the material into shape with the fingers and paint or color the maps, as they choose. A coat of shellac will preserve them. Temporary relief maps of sand are made to illustrate passing problems (p. 47).

(4) *Outline maps* begin in the second grade with crude sketches and outlines in sand or on paper, of the garden, the room, or the location of interesting things. The earliest work is temporary and no attempt is made to hold to scale. In the third grade some accuracy and sense of proportion are reached — in the upper grades they are very definitely attained.

(5) *Floor maps* can be used by a skillful teacher to good advantage, in a room with movable furniture. A large outline of the desired country is painted upon the floor — the top being always toward the north. The details of the parts under discussion can be filled in with crayon as needed and erased after use. Miniature houses, trains, or other objects are used at times. This type of map gives excellent opportunity for showing water routes, roads, railroads, and industrial conditions.

(*b*) *Printed maps*, carefully made, are needed for the work in the upper grades in history, geography, and science; the school-made maps cannot take their place. A number of firms publish a series of such maps, worked out to meet the varied needs, and other firms and organizations have special maps, complete and in outline forms.

(1) A set of large wall maps is essential for the upper grades. One set will serve an entire school. The initial cost is high, but the set lasts indefinitely if the maps are kept mended from time to time and rolled in their metal holders. The following are recommended by leading geography teachers; others may be added to the list:

The *Goode Series*, published by Rand McNally.
The *Kuhbriest Series*, published by A. S. Nystrom.

(2) *History- and Geography-outline maps*, large and small, are obtained from the above firms and from many school-

supply houses for a few cents each. The McKinley Publishing Company (which publishes *The Historical Outlook*) carries an excellent set.

(3) *Pictorial maps* in color (75 cents to $4.50) are most interesting and are excellent for stimulating older children to make reproductions for themselves. An increasing production is noted — Houghton Mifflin Company, P. P. Bowker Company, the Book Shop for Girls and Boys of the Women's Educational and Industrial Union, and other publishers are making pictorial maps and will send descriptions on request. These maps are also found in magazines or advertising sections now and then. Reproductions of delightful old historical maps and mariners' charts cost $1 each at the Sea Arts Guild.

(4) *Aërial maps* (pictures taken in airplanes) are most valuable for all grades, since these show both outline and elevation; are absolutely accurate; and so give clear, definite ideas not to be obtained otherwise. Excellent specimens are found in newspaper pictorial sections, and in magazines, especially in the *National Geographic*. Map publishers are also making these maps. Investigate.

(5) *Star maps* can be obtained from the Comstock Publishing Company, and are most interesting for older children.

2. *Globes*

Globes are used in the upper grades. The following are suggested for each school.

(*a*) One large, 16- or 18-inch (preferably) or 12-inch globe, showing names, meridians, parallels; to be had from any map-publishing or geography-supply company, at various prices.

(*b*) Six small, 6-inch globes for individual use, at about 25 to 75 cents from the above sources, or often from ten cent stores at 10 cents.

3. *Charts*

Charts, also, are occasionally helpful for work with older children. They can be made by the children themselves or obtained from educational organizations and from the United States Government, publishers of books and maps already listed, and advertising firms.

d. Other Printed Material

1. *Nature Notes and Note Book*

Excellent material on nature subjects (birds, flowers, trees, insects, stars) comes from the Comstock Publishing Company in an inexpensive form, planned in such a way that children will not only get the facts needed to begin with but will keep on observing and adding more facts. Much of this material is in notebook form, well illustrated, and is suitable for upper grades. Write for catalogue of Field and Camp Note Books and other publications and specimen sheets, and select the material as it is needed.

2. *History Aids*

(*a*) A facsimile copy of the Declaration of Independence can be bought for $2 from the Tabor-Prang Art Company.

(*b*) *Things All the World Knows:* A list of the twenty-four wonders of the world: the Pantheon of Paris, the Hall of Fame of the French Republic, the Sphinx and Its Riddle which none could answer, and others. On a card two by five inches, ten for 10 cents from the Newark Museum.

(*c*) Current News for children's use is furnished by the following:

The News Outline (fifth and sixth grades)
Current Topics (seventh and eighth grades)

(*d*) McKinley *Illustrated Topics for American History*, The McKinley Publishing Company.

e. Bulletin or Display Boards

The bulletin board serves all phases of social and scientific work as well as English work (p. 157), and other school needs and activities. The boards may be fixed, movable, or folding. Descriptions, directions for making, and a list of the materials required, are given in Furniture and Fixtures (pp. 305–307).

1. *Central Bulletin Board*

A large bulletin board kept in the hall or in some other accessible, well-lighted place, will interest all the children, has a strong social and unifying value, and motivates interest in reading.

(*a*) It is used for notices, announcements, school news, community news, clippings, pictures, or for anything else which is of general interest or value to all the children and teachers.

(*b*) Some items are changed daily, others stay on for a week or

more, according to their purpose. All material is kept up-to-date; no stale news or old notices should be left up. This is very important.

(*c*) All the children are encouraged to read the bulletins daily and to talk over what they read. They are also expected to read important notices of school activities and are held responsible if they fail to do so.

(*d*) A committee of children, one from each group, can manage the central bulletin board under the supervision of some teacher.

2. *The Classroom Bulletin Board*

Each room also needs its own bulletin board — sometimes two — for notices, directions, pictures, special material, and other material which is of interest or importance for the special group. The boards must be well lighted and accessible, and the floor space in front must be kept clear. Care should be taken that the board is not overcrowded; moreover, if the material is to hold the children's interest it must be changed frequently. The teacher supervises all that goes on the board, but the children suggest and execute plans. A well-managed bulletin board reflects the whole work and interest of the group from day to day and aids both in study and in social development, for it is used to illustrate science, history, or geography topics by means of pictures, clippings, and notes, to motivate reading through its interesting content, to give practice in actual reading, and to further social activities.

(*a*) The primary boards show a good many pictures, always labeled in large, clear print, illustrating topics of interest. All reading material used with these pictures should be large and easy to read.

(1) The first grade often uses large printed strips carrying such inscriptions as "Easter Greetings," "This is St. Valentine's Day," "Circus Day is March 12," and so forth — a simple way of publishing news. Smaller notices, such as "Cocoa for lunch — 5 cents," or "Mary and Frank see Miss B," are posted; also committee lists of names, such as the lists of "Dusters," "Book Collectors," "Cupboard Helpers," and other workers — to avoid any mistakes as to "who's who."

(2) The second grade uses its board in much the same way.

(3) The third grade adds clippings and more general news.

(*b*) The upper grades use the bulletin board for more varied purposes:

(1) The children post their own notices for special work or group meetings.

(2) The material includes records of both class and outside interests. Often the whole board is used to illustrate a topic that is being worked out in class, such as the colonial period of the home town, with pictures, diagrams, an old letter, and other things posted; or some public event such as a presidential inauguration, with pictures, descriptions, lists of officials, and other items on the board.

F. MATERIALS LISTED ELSEWHERE

As already indicated, much material which is essential for grade teaching in history, science, and geography, is listed, for the sake of convenience, in other chapters. For instance, there is no possible way of separating certain construction activities from the content side of the above subjects, nor any way of teaching content in the elementary school without some construction work.

Broader experiences with real things on the one hand, and books, pictures, models, and specimens on the other, are needed to supplement the school experiences and the facts of the texts if the children are to have rich, full understanding, hence —

1. *For Work Material and Plans for Making Things*, see Constructive Activities (p. 45).

2. *For Supplementary Experiences*, see School Exhibits (p. 255).

3. *For Models, Specimens, Collections*, see School Museum (p. 216).

4. *For Pictures and Films*, see School Pictures (p. 229).

5. *For Books*, see English Activities (p. 132); The School Library (p. 199); Appendix, Part One.

CHAPTER THREE

CONSTRUCTIVE ACTIVITIES AND MATERIALS

FINE AND INDUSTRIAL ARTS, ILLUSTRATIVE WORK, JOBS, SELF-DIRECTED WORK AND PLAY

KINDS; MEANING

Constructive activities include all kinds of handwork and are often, for convenience, divided into the following groups: Fine Arts; Industrial Arts; Illustrative Work; Jobs; Self-Directed Work and Play.

There is, of course, no such clear-cut division. A practical wastebasket, for example, woven of willow or hickory splints, artistic in shape and lovely in color, belongs in three of the above groups. It is also true that the same material is used for all types of expression — clay, cloth, paper, and the other materials and tools serve common purposes. So there need be no further discussion of types of work, after the following survey:

First: *The Fine Arts.* (See Art, p. 158.) Here the child freely expresses his feeling, thoughts, interests, and ideas in drawing, painting, or modeling, and he also decorates or makes beautiful material that is already made. In this work we find wonderful opportunities for spiritual and artistic growth. Creative imagination is stirred, and good taste and appreciation of beauty in all its forms are developed. The teacher's problem is to make sure that the children see, hear, and read beautiful things, and that they are helped to understand them and also to make useful application in their everyday work of the ideas which they thus gain.

Second: *The Industrial Arts.* (See History, p. 7, and Industry, p. 8.) In this class comes all the work of changing the raw material of nature into more usable form. We have spinning, weaving, pottery making, sewing, carpentry, basketry, cooking, and other processes. To-day much of this work is "manufacturing," yesterday it was "handcraft"; day before yesterday it was "primitive industry."

The teacher's problem is to keep all this work in its proper setting and to have the children see that each art is a part of living as a whole, not a separate activity. People did not in the old days, and do not to-day (except in factories), do one thing and nothing else.

The weaver of more primitive days did not stay always at his loom. Food was needed, the sheep must be cared for, more thread must be made ready for the next cloth. So he and his family by turns dug in the field, cooked food, tended the sheep, and spun and dyed more thread. He wove in order to make clothing that could be worn by his family or else exchanged for some other useful commodity. Tied up then, in the weaver's art, was farming, cooking, sheep raising and shearing, spinning, dyeing, weaving, and barter or exchange. Even in our highly specialized life to-day, cooking a dinner requires help from farming, transportation and marketing, manufacturing, coal and iron mining, lumbering, and gas making.

If the teacher does not understand this relationship and help the children to feel it, much of the work is meaningless and leads toward nothing, for mere information does not last.

Third: *Illustrative Work.* This grows out of the children's experiences and their study of history and geography. Here we have all the work which shows things as they were, are, or should be. Models or representations of trains, boats,

PLATE V. SELF-DIRECTED ACTIVITIES

Second-grade children, Campus Elementary School, Maryland (Towson) State Normal School, working out individual interests with many kinds of materials

PLATE VI. WOODWORK AND OTHER CONSTRUCTIVE ACTIVITIES

Fifth-grade children in the Winnetka, Illinois, Public Schools, using their regular classroom for a workshop

and other forms of transportation; of people and animals; of houses, villages, farms, mines; of land and water, and of many other things fall into this class. Product, relief, and outline maps, booklets, posters, and charts, also fall into this group. Such work belongs almost entirely in the upper grades. Its principal aim is correctness and accuracy. It sends the children to real experiences, books, pictures, and other sources of information. It clears up misty ideas and calls for definite knowledge. This is the easiest form of handwork, and although somewhat overdone in certain schools it has a very real value, especially in crowded schools. Needless to say, illustrative handwork should be balanced by other kinds of construction work.

The teacher's problem is to see that the above purposes are carried out. Ideas must be really made clear, not muddled worse than ever. Information must be accurate and correct. The children should not be allowed to try to illustrate things that are too far away from their real experiences for them to understand; the younger the child, the greater the need for care in this matter. The teacher must also be sure that the work is worth while and that it avoids a fault that is common to most reproduction of this kind — that is, tiny models, too many details, overelaborate workmanship.

Fourth: *Jobs.* Real work which grows out of a real need comes under this heading. Mending a torn shade, putting a shelf in the closet, making a new handle for the broken rake or a sawing board to protect the table, painting tables and chairs, all the many tasks that come up in everyday living, are well worth doing. This is truly social work — for a common cause and to be taken part in by all. It certainly helps the children to be resourceful, careful, and thrifty, and no other type of constructive work can take its place.

The teacher's problem is to help the children see needs and meet them. Assigning too difficult work to a given group must be avoided. Help from others should be asked for when needed. Coöperation should be developed and interest in the work encouraged. Every one must have a share or take turns.

Fifth: *Self-Directed Work and Play.* Here the child works out freely some idea or special interest in which he alone is concerned. He finds his own task, material, and method of work, and receives help only as he feels the need for it. This plan is fundamental in education, and should apply in a large measure to all constructive work. It offers the chief opportunity for growth in creative power and individual development. The teacher's problem here is to keep "hands off."

VALUES All who know anything about children know too what joy they find in making things, and whoever watches the physical activity which some of this work involves will realize what an immense aid to growth it offers. So these values need only passing mention. But perhaps other results of the work are less clear — therefore a fuller discussion is in order.

We know from both common sense and psychology that what the child actually does he understands, remembers and uses best. We know that expression through making or constructing is a universal impulse. Certainly it is true that a child finds special significance in a beautiful sunset or a splash of autumn color if he has a chance to express in painting the feeling which the actual glory rouses in him. He understands weaving as a process only after he has set up a loom and guided the threads or strips over and under, over and under, till a new product is made. Seeing some one

else do this is not enough: it is this fact that we so often forget in our enthusiasm for "visual education."

Again, life demands much *doing* for its very existence. The simplest type of living depends upon having something to eat, something to wear, and a place for shelter and protection; even more, naturally, does the most complex type of living. These needs must be met to-day just as they were met thousands of years ago by *taking nature's materials and making them into a form which we can use.* This is the basis of all invention. Methods change, but a knowledge of nature's fundamental laws and immediate products is absolutely necessary and the simpler combinations of these laws and products help explain the complex ones.

The boy who has dammed a brook and made the water turn his wheel has a real understanding of water power and its use. If he has helped to lay a water pipe to the barn and the kitchen, a city water system is no mystery to him. For the children who have planted and picked cotton, taken the seed out by hand, and twisted the fiber for thread, the gin and the great factories have new interest and meaning.

As the youngsters work, trying out ideas and reproducing various experiences, there are always significant developments. Poor judgment and good judgment; careful work well thought out; carelessness and hurry — each of these tells its own unmistakable tale. If the table is unsteady or the apron too short a child needs no teacher to tell him the "answer" to his problem. Wool-gathering means spoiled work. Looking at a neighbor's work instead of doing the work in hand results in unfinished tasks and disappointment. "Stick-to-it-iveness" produces results.

As hammer and saw, ruler and pencil are used day after day, nails go in just where they should, lines are clearer and more firm, measures are sure, and trained muscles obey higher orders — skill grows. With the task, large or small,

well done comes the joy of successful creation and the courage to tackle other and bigger tasks. This is a tremendous experience in a child's life.

Other tasks, other problems, other gains. What is the right way to put a wheel on a wagon? How is a hand loom made? How wide shall a certain shelf be? Curiosity and fresh interest develop, and the child who started out with a simple problem and a limited interest may catch, before the work is done, a new vision of that relation to a larger world which is not a fragment, but the whole.

The wood for the shelf takes the young workman to the dealer, the lumber yard, the railroad, and finally to the great forests. Commerce, manufacturing and transportation are all represented. The toy wagon may take its maker on a long journey — first far back to the man who had only his own shoulders for bearing his load, then forward and onward, passing on the way beasts of burden, log rafts and canoes, crude sledges, two-wheeled carts, coaches, sail boats, steamboats, and trains, till he is again among electric trains, automobiles, and airplanes. Eager children go to books and pictures to get more food to satisfy this growing hunger for knowledge; and even the stand-pattest parent owns up after awhile that his boy is learning something.

This something is often far bigger than we know. For it is just this seeing of his own work in its larger setting, this realizing of larger relationships, of causes and results — that lifts a child's expression in handwork to its highest educational level. Needless to say, no teacher should feel satisfied till this has been achieved.

After children have worked hard and produced something worth while, after they understand that numberless connected activities are involved in making the simplest things of everyday life, they inevitably have a new interest in work and the workers of the world, and a new respect for it and

for them. This broadening of outlook and social understanding is exceedingly important.

Coöperation, unselfishness, and thoughtfulness for others cannot be learned in a general way. All social feelings and spiritual ideals must have their root in simple everyday realities, and there is no better way to learn these early lessons than through the give-and-take of work. The children will find that doing things together is more fun than working each for himself. They will learn that nobody likes a disagreeable person; that turn about is certainly fair when otherwise a child would have to wait so long for the saw that he could not finish his work on time; that helpfulness is the best plan all the way round — giving help to-day and receiving help to-morrow.

Real experiences are as necessary for spiritual growth as for mental development, and in both connections must be simple, direct, and full of meaning for the children. The youngster who faithfully does his share of the work, helps a friend, puts things back in place, owns up when he is at fault, and is happy with others in their success or pleasure in everyday work and play, is laying in his character the foundations for the highest ideals and the finest service.

Other gains there are that are perhaps dearer to the unthinking than those just mentioned. As the children work they must measure and estimate, and so are constantly adding, subtracting, multiplying, dividing — a kind of arithmetic (p. 33) that is more clearly understood and more easily remembered than the ordinary kind. Again, clay must be ordered. There is a brickyard in Columbus, a pottery in Albany. Which town is nearer? Where can clay be bought most cheaply? What is the freight rate? Letters must be written (p. 139), reports read, costs compared, and the clay finally ordered. Here we have all of the "3 R's" busily in action.

Constructive activities, then, if wisely used, not only mean joy and physical growth for the children, but are a help toward clear ideas and definite information. If all opportunities are well used, such practical results as manual skill and improvement in arithmetic, reading, and writing will surely follow. Add to these gains creative thinking, social coöperation, broader interests, and a new vision, and even then the tale is not told. Just try it and see!

CONTENT; RELATIONSHIP

There are other important things to note or to restate. One is that the constructive activity, if it is really worth while, never stands alone, is never an end in itself. It starts with an idea and broadens into many other ideas and interests. These ideas come from various sources. The regular subjects (history, geography, science, art, English) supply many motives for handwork. The child's own experiences, real and imaginary, add other motives; so do also actual needs of many kinds. Indeed there seems no excuse at all for purposeless, unrelated work. It is also true that wood, clay, paper, paint and so on, are merely materials to be used when they best serve the purpose in hand, without thought of sequence, technique, or other formal terms.

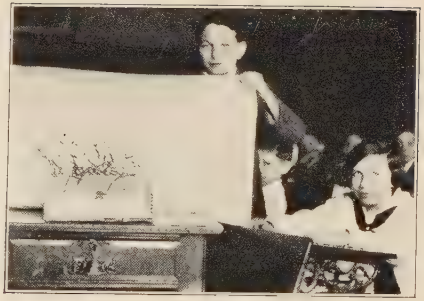
METHOD

Now for other matters. Every child, as has just been said, likes to make things, and in most cases this interest holds all his life long. Certainly it is a big factor all through the elementary school years, and the wise teacher who can watch children and work with, instead of against, their natural development, will find help here for both method and material.

At first the making and playing (see Play, p. 175) are closely connected — now one, now the other in the lead. Sometimes a child plays because he has made something

PLATE VII. PRACTICAL ACTIVITIES

Upper-grade boys, Washington, D.C., Public School, painting furniture and other school equipment. (Copyright by Underwood and Underwood, Washington, D.C., Photo Service)



The plant

Grinding grain and bolting flour

Mixing the dough

Baking the bread

PLATE VIII. INDUSTRIAL ART ACTIVITIES

Study of wheat by fifth grade, Passaic, New Jersey, Public Schools. All the work was done in the regular classroom with simple equipment

which suggests play; again he makes a certain thing because he needs it for his play.

A little boy is drawing pictures. He has made two figures, one large, one small, without plan. Suddenly his imagination stirs, and play begins. "Here is a man. This is his little boy. Now I'll make a house for them. Here is their automobile," and so on. Another child climbs to a high seat and plays that he is a mighty king. Suddenly he remembers that to be a king one must wear a crown. The play stops till the crown is made. Then the small worker crowns himself, and presto, here is a real king on the throne. John takes a string and two pieces of wood and makes a bow and arrow, but it is Robin Hood or a fierce Indian warrior who places the arrow and pulls the bow. Later picture, crown, and bow are thrown aside — after all the play's the thing.

A group of children decide to make a grocery store "just like Mr. Burke's." The interest is keen, the work goes briskly, and the finished store is shown with great pride to all who will look. Once done, however, and exhibited, the interest quickly goes. Other activities call — the work's the thing!

After a while the child sets a higher value on the object that he makes. It is worth something in itself, he thinks, and so must be well made. Greater care is given to details. The object must look as it should, or do what it is supposed to do. The miniature village must have homes, stores, and public buildings; the wagon must have wheels which really turn.

Still later comes the desire for perfection. The costume must be correct in detail, the bowl must be smooth and shapely, the picture must have beauty of color and sureness of line. In other words, the need for *technique* has come.

The play interest is at its height in the kindergarten,

though it is also fairly active in the lower primary grades. Real interest in technique falls outside the elementary school period, though in some degree it is to be noted in the upper grades. For the most part the children in the first seven grades of school find their joy in the activity itself and vigor, spontaneity, and creativity, rather than finish or perfection is all important in their work. With this borne in mind, the teacher's problem of method seems less complex.

The essential thing is that all work shall express the child's own ideas, interests and abilities, not those of some one else. He must get ideas before he can go very far with his work. Experiences and some understanding of them are essential; the child with few experiences has few ideas. Certainly he cannot express *anything* until he has *something* to express. In most cases, before the child sets to work the teacher should be sure there is something in his mind that he wishes to express in action. With older children, too, a definite plan is needed. Changes are made as the work goes forward; but it usually doesn't go forward at all unless the worker starts out with some idea of what is wanted and, once the early experimental tryout (p. 60) is over, how it is to be obtained.

Again, crude work is natural and to be expected from the elementary school child. "Perfect" work is not to be desired. A child should not attempt to make his work too finished in appearance. Work of this type should be looked on with mistrust; either the work was touched up (which is dishonesty), or else the small worker was sacrificed.

On the other hand, the term *crude work* does not mean sloppy or ugly work — neither of those kinds should be allowed. A child must do his best, always. If his work does not show improvement, something is indeed wrong. There should be steady gain in each child's accuracy and muscular control and in the beauty of his work. It is growth or improvement which counts, however, not the excellence of any

particular piece of work, and the check-up should be made with regard to the child's own development and improvement, not by comparing his work with some other person's work. Every teacher should bear these points in mind.

Handwork, especially for the primary children, should be of the large type and should call for the use of the larger muscles of arm and body rather than for the finer muscles of the fingers. Small detail work is bad for the eyes and causes nervousness. In drawing, painting, and writing big, free movements are best, and so large brushes, crayons, pencils, and sheets of paper are needed. Sawing and nailing are good activities for primary children. All paper construction should be on a large scale. In the lower grades sewing calls for needles with large eyes and for long stitches and loosely woven cloth.

All this means that much of the former plan of working must go overboard. No longer need the primary teacher spend most of her summer-school time in collecting patterns for the children to use and making models for them to copy. If children are to be creative and original, the old habit of dictating each step of the work becomes obsolete. Cut-and-dried plans, made weeks in advance or taken whole from books or courses of study, are impossible, but haphazard work is by no means the alternative here.

In order to succeed in this work the teacher must have a fuller realization of its possibilities. Children are capable of far more in initiating, planning, thinking, and actual work than the majority of teachers either realize or permit. Reading about progressive school work helps teachers to see this. Some confidence and a real interest on the part of each teacher are essential to success, and patience will indeed prove a virtue, for the changes must be gradual, and results will come slowly.

There will always be for the teachers a certain degree of re-

sponsibility. They must see to it that the children have the experiences they need, and that opportunities for working out ideas are provided in school. They must also see that the work done is worth while, not trivial, and must help the children to tie it up with other activities and with the larger realities. They must encourage, sympathize, criticize, and stand ready to help whenever help is really needed.

In trying this work for the first time it will be well for the teacher to let it grow out of the regular school subjects (nature study, geography, history), which contain many natural suggestions for handwork. Until the workers can shake loose from the old ways of doing things and from the new hesitations and uncertainties, it will be wise, also, to choose a quiet type of activity (drawing, painting, sewing, or weaving), which involves fewer movements and adjustments. By degrees there may come greater freedom in choice of both topic and material and any worth-while interest or experience or need can be worked out (school equipment, Christmas work, toys).

From the first the children are encouraged to try out their own ideas and if possible to correct their own mistakes. A word of caution seems in order here. Experimenting does not mean idle changing from one thing to another. Work once begun must be finished. Of course, it goes without saying, children should not be allowed to attempt work beyond their powers, since the discouragement caused by failure is bad for the morale — and naturally failure will follow a badly chosen project.

Just as soon as she can, the teacher shifts to the children the responsibility of finding and working out their own problems. It should be impossible to fix a specific time for this transfer of responsibility; there are many things to be considered. All we can say is that freedom should come as

fast as the children are ready for it, and that this readiness will be indicated by growing interest, steadiness, and the habit of working and thinking independently. Leaders from among the children themselves, if they have initiative and vital interest, will be of great help, but these leaders must be careful not to dominate the group and do their thinking for them. Miss Dobbs in[1] *Illustrative Handwork* suggests, as one method of introducing the really free work, that a "small group of trusty children be allowed to work out all by themselves some attractive project." Other children will try for the same privilege. This is a good plan if some of the children in the group are clever as well as reliable; otherwise it will fall through for lack of ideas.

Getting started is sometimes difficult. In many cases the youngsters need no help, but sometimes their suggestions or plans must be modified. Sometimes a first suggestion must come from the teacher. She offers it directly, by simply proposing a project or indirectly by telling the group something that other children have done. A piece of work put in plain sight without comment; work material left within easy reach; or — for little children — playthings placed ready at hand will often prove sufficient incentive to action. But whatever the method, once the start is made the children should work out the details in their own way.

There are several ways of working. Sometimes a child works by himself at his own special project, making a toy or a picture according to his own plan. Sometimes all the children make the same thing, but each does the work in his own way. For example, every first-grade pupil brings his own box and makes a doll house, but Frances chooses to use her box for a bedroom while William prefers that his shall be a garage. A health booklet is made by each of another group, but no two booklets are alike. Until children and

[1] Dobbs, E. V.: *Illustrative Handwork.* The Macmillan Company.

teachers become familiar with these new plans of working, it will be wise to follow the latter arrangement.

A group project must be very carefully thought out. Children and teacher talk over plans, clear up ideas, ask one another questions which stimulate thinking, and review experiences that bear on the subject in hand. Sometimes there is need at the outset for additional reading, for another visit, or for further investigation; but usually the work is under way before this check-up seems necessary. Care should be taken not to spend too much time in talking, otherwise the interest will disappear. Each child should have a special task, or part assigned. Making a puppet show in the sixth grade requires a playwright, puppet makers, stage builders, scenery painters, and, of course, some one to pull the strings and talk for the puppets. All work is discussed and checked up from time to time by the group as a whole, and the final project should be approved by all.

PRACTICAL PROBLEMS

Many practical difficulties must be met and some rather hard problems worked out.

Lack of skill — not knowing one's self, how to do what the children are expected to do — is the problem of many a teacher; but fortunately much help is available. There are recipes and printed directions to be consulted, as well as books of instruction which the children themselves use.

A check-up of the talent in school may indicate just the person needed. Charles H. in the sixth grade, overgrown and over age, may be a wizard with tools, and Miss Brown the fourth-grade teacher, a born artist with a wonderful eye for color. An exchange of work, or a request for help now and then would be a fine plan for Charles needs recognition and encouragement, and Miss Brown has a hard time teaching arithmetic.

In many communities, friends and neighbors will respond to calls for help, now and then, in a project. Mr. B. the carpenter, will be glad to give advice about built-in shelves and aid in ordering lumber. Old Mrs. S. will bring out her spinning wheel or show the children how to set up a loom.

The vexing problem of *where to find time* is partially solved by using the regular subject (geography, history, reading) period, for constructing. That merely means using it for a different kind of recitation, in which a child tells with his hands instead of with his lips, and a far better way it is, in many cases. A flexible schedule is essential and a sudden change in the use of an assigned period should be a matter of course.

The two-group plan of most grades always leaves one division free for work; the fact that the teacher is too busy to watch the workers closely, is all in favor of original production. Certainly one open or free period of thirty minutes may go into the regular program of the day and will take care of the noisy work. Odd moments may be used for finishing up work begun in other periods.

The *amount* of time that should be allowed for construction work cannot be definitely indicated. At least forty-five minutes each day seems essential for all grades, with as much more allowed as is possible.

A place to work is needed. Sometimes shops are provided, but usually the classroom is the best place, particularly for the primary children. Movable furniture (pp. 289, 290) and a group room (p. 308) are of great help.

Older children may often be allowed to scatter and work outside the room. The teacher will check up results and take away the privilege if it is abused. Sometimes it is a good plan to let an older child oversee several of the younger children in their work. Unused rooms, well lighted

halls, vestibules, porches, and shed rooms, and a dry and well-lighted basement may be used for these purposes.

Outdoors has many possibilities as a workshop, though few teachers make the most of them. In the South and in parts of the West the children can be out practically the entire winter, finding all sorts of things to do.

The following suggestions are offered for the work in general.

First: Get the outdoor habit, and save nerves by eliminating noise, confusion, dirt, and other troubles. A great deal of construction work can be done outside, and rural and small-town teachers are urged to take advantage of every opportunity of that kind. Cold, unless very severe, does not matter if the children are active and warmly dressed. They build health as they work.

Second: Protect the children's clothes at school. Parents protest against the kind of work which causes soiled or stained wearing apparel. The use of heavy work aprons will do away with the need for painful interviews and save much trouble. Small rugs on the floor are also clothes savers.

Third: The first time children handle a material it is well to allow them some opportunity for testing it and for free play with it before they go definitely to work. This is always necessary for the little children and usually for the older ones.

Fourth: When there are new recipes and suggestions for new material, it is often best for the teacher to try these out before the children use them.

Fifth: The problem of cleaning the hands after dirty work is often solved by passing a pan full of moist wrapping paper (newspaper will not do), torn into fairly small pieces. The child rubs his hands with a small quantity of the paper and then drops it into the wastebasket. Cheap toilet paper also may be used.

A village made of wooden boxes by rural school children

Made of cardboard boxes by eight-year-old children, Winnetka, Illinois, Public Schools. The mountains are dyed purple at top and green at bottom

PLATE IX. VILLAGES MADE OF BOXES

A high fence makes an unusual but practical blackboard in the Los Eeliz School, Los Angeles, California

Old burlap sacks, and poles from the woods were used to make these wigwams

Made by the second-grade children, Springfield, Massachusetts, Public Schools

PLATE X. FURTHER CONSTRUCTIVE ACTIVITIES

Sixth: The children should always clean up and put things away after work (p. 324). Unfinished work is put in lockers, behind screens, or on a special shelf of the cupboard. Finished work should be given to the owner, or, if kept for exhibit, stored in a safe place — never left with the material.

HELPFUL REFERENCES Books and pamphlets which give helpful information and advice will be found in the Appendix.

MATERIALS; EQUIPMENT Materials and equipment for this work are of great diversity and the problem of making, using, and caring (pp. 312-339) for them needs earnest consideration. All prices quoted are approximate. Addresses are listed in the Appendix. A discussion of this subject follows. The classification is: A. Materials. B. Tools and Practical Appliances. C. Suggested Lists and Plans.

A. MATERIALS

Materials for use with constructive activities are of great variety. Some of them are a part of the regulation school supplies, and others come, as will be indicated, from many and various sources. The teacher selects those that are suited to the special need. The following are discussed:

Blue print
Brown print
Boxes
Calcimine
Cement
Clay
Cloth
Crayons, chalk, charcoal
Dyes
Fasteners
Glue
Inks
Leather
Linoleum
Metal
Nails
Nature materials
Odds and ends
Paint
Paper
Paste
Plaster of paris
Sand
Sandpaper
Sawdust
Shellac
Soap
Wood

BLUE PRINT AND BROWN PRINT MATERIALS

(See also Sandpaper; Linoleum)

Making blue or brown prints is attractive art work for the older children.

Pieces of glass (trimmed pieces of broken window panes), cardboard cut the same size as the glass, two snapper clothespins, and blue or brown print paper are needed.

a. USES

The prints make charming art studies, and can also be used to illustrate nature booklets and charts and posters, and to decorate book covers, calendars, Christmas cards, valentines, and programs.

b. KINDS: SOURCES: PRICES

The paper can be procured from an architect, a contractor, a drug store, a bookstore that carries kodak supplies, from The Chicago Apparatus Company, the Central Scientific Company, and from any mail-order firm.

Blue print costs $1 for a 10-yard roll, 30 inches wide; for a package of 24 sheets, 4 × 5, 22 cents; 5 × 7, 28 cents; and 8 × 10, 45 cents; in postal card styles, about 25 cents a dozen. Brown print paper costs slightly more from the same sources.

c. SUGGESTIONS

1. *To Make Prints*

(*a*) Cut the paper or cardboard, place the objects to be printed (grasses, leaves) on the paper and cover them with glass. Use snapper clothespins to keep the arrangement firm.

(*b*) Hold the work in the sunlight till the paper looks bronzed, then remove the glass and the objects and wash the print in several waters or in running water.

BOXES

Boxes of wood, tin, or cardboard, both large and small, are real treasures for the school with little money to spend, and are useful in any school, since the variety in form that they offer suggests many uses and makes the work easier.

a. KINDS; USES

1. *Wooden Boxes*

Wooden boxes (cigar, chalk, soap, ink, fruit crates, large packing boxes, a piano case) are strong and durable. They can be used out of doors and for the more permanent and practical work.

(*a*) A certain outdoor project was very successful in a village school. A discussion of what a village should be like had set things going. Boxes of various sizes, some nails, a few cans of paint from the ten cent store, and the activities of an energetic third grade combined to produce a model town with houses, streets, playgrounds, and parks. Many lessons in city planning, hygienic sanitation, civic beauty, and social responsibility were learned as the work went on — roofs and porches were added and paint slowly completed the process of changing plain boxes into attractive and lifelike houses, each in a proper setting. The work was free and changed frequently. Groups worked together and then separated for special jobs as the call came, or as the idea grew. The project extended over several months, the interest never failed, and recess time on good days was eagerly devoted to work instead of games.

(*b*) For a doll house first graders will find it easier to fit or nail together several boxes of equal size than to put partitions into one large box. The rooms should be furnished separately before being put together. Orange crates are especially good for this purpose.

(*c*) A puppet show stage (p. 178) is made from a large box with one side and the top left open. A miniature stage of the ordinary kind is another suggestion.

(*d*) A 12-inch square box with a back nailed on made a chair for the first-grade play house, and an oblong box into which shelves had been put, served as a cupboard for the same house.

(*e*) Bird houses and houses for pets or for very small animals are also produced from boxes (p. 15). One rural-school group of older boys made some up-to-date laying boxes with trapdoors, for use at home in the chicken yard.

(*f*) Smaller boxes (ink, chalk, cigar) are changed into cupboards, dressers, beds, and other doll furniture, and into other

playthings which are strong and durable Paint and little knobs or handles made of push pins or of brass tacks make the products very realistic.

(*g*) Shallow boxes (p. 327) are good for collections of minerals and other specimens, and for other uses besides (p. 38).

(*h*) From the wooden boxes comes also some of the needed wood supply. But the wood must be soft and free from knots, or the results will be disappointing (p. 114).

(*i*) Other plans are suggested elsewhere (pp. xxv, 332).

2. *Paper Boxes*

Paper boxes also serve many purposes and are more easily used by small children than wooden boxes.

(*a*) The large, heavy, corrugated cardboard cartons make fine dolls' houses; the smaller ones can be used for individual rooms or for smaller houses. Hat boxes, also, are excellent for this purpose.

(*b*) Peep shows are fascinating to make; for these shoe boxes or boxes of larger size are needed. A peep show is a tiny scene inside a box. The top of the box is covered with some colored material (tissue, crêpe, double net) thin enough to let the light in but not thin enough to see through. A peephole is cut at one end. One child alone or two or three children working together can develop a project of this kind illustrating a story or a history or geography lesson. A second-grade child constructed a peep show of Dr. Doolittle curing the monkeys in Africa; he made his animals of heavy paper (free cutting). Some older children made a very pretty Japanese garden scene (paper construction) to illustrate their study of Japan.

(*c*) Square or oblong boxes are easily changed into houses for set-ups or models, by adding roofs, porches, and windows; and round cartons become tanks, boilers, silos, and boats. The boxes may be calcimined any color.

(*d*) A few cuts with the scissors turn boxes of all shapes into furniture and many other desired objects.

(*e*) In a rural school which had no tables and only slant-top desks, the children used large flat boxes for individual scenes and for relief maps, the rims of the boxes keeping the material in place.

A suit box held a charming water scene. The bottom was calcimined in blue, and there was a paper-pulp shore built up around the edge, and a dock of cardboard. Boats and fishermen were in the water. One box top held an excellent relief map of a near-by section of the country.

(*f*) Most of the cardboard needed is provided by boxes (see also Paper). Florist, laundry, hat, and suit boxes supply large pieces of medium weight; the odd pieces make good paper pulp when soaked. Heavy cardboard glued together can be used for making substitutes for toys and toy animals. Cut two of each shape, glue them together, and press them; then, after they have dried, paint and shellac them.

3. *Tin Boxes and Cans*

(*a*) Tin boxes and cans make excellent containers for material or for trash and are also used for bird houses (p. 15).

(*b*) The tin can flattened out is used for metal work in school. For full directions see: "Tin Can Toys." This suggestion is chiefly for the older boys in rural schools.

b. Sources; Cost

Boxes cost nothing; they are easy to obtain from the stores, where they are discarded in large quantities; from homes, from the laundry, the cleaner, the florist, and many other sources.

c. Quantity

Many boxes are needed, but since they are likely to be bulky it is best to keep on hand only a limited supply of specially good ones, assorted in size for special work, and to collect others as needed. Fit the smaller ones inside the larger.

d. Suggestions

1. *To Obtain Boxes*

(*a*) Interest some sales person in a local store in saving certain sizes and types of boxes, particularly those for the cardboard and the wood supply.

(*b*) Have the children furnish their own boxes when possible.

CALCIMINE (FRESCO OR WATER-COLOR PAINT) AND DRY COLOR

(See also Brushes, Paper, Easel)

This material is a clean, easily mixed, easily handled powder which is invaluable in the school for constructive activities as well as for practical use. It is far less expensive than the prepared paints and gives good effects with articles that are not designed to last a long time.

a. Uses

1. *For Art and Construction Work*

(*a*) The primary children paint gay pictures with calcimine. The colors go on smoothly and give much quicker effects than crayon and are almost as good as expensive show-card colors.

(1) This painting is done on large pieces (18 × 24 inches or larger) of cheap unglazed paper or unprinted news paper thumb-tacked to wall, picture board or easel.

(2) In work done with free, big-arm movements, use large (wash) paint brushes or cotton swabs on sticks.

(3) About six or eight children can work at the same time, the different groups taking turns.

(*b*) The older children paint posters, stage scenery, and other material in which a mass of color is desired.

(*c*) Calcimine, or dry color, sized with glue, can be used as a coating on wood, clay, unglazed paper, and cardboard; it covers soil, advertising printing, and other defects.

(1) All sorts of color plans can be worked out. The miniature farm with a green and white cottage, a barn of white or soft gray-green, and other outbuildings to match is an attractive project. The walls, floors, and paper furniture of the doll house can be quickly and effectively painted.

(2) Calcimine will color paper people and animals, also clay vegetables, fruits, beads, and pottery. Dry the clay thoroughly and use a thick coating.

(3) Sprinkle bright green or brown powder (a dry color is best) on sawdust, and add a little water. The result will be

realistic grass or soil ready for a miniature "set-up" or for maps (p. 109).

(*d*) Dry color made in thin solution with a little glue or mucilage for sizing, when used on unbleached muslin makes a beautiful temporary fabric for draperies, screens, and costumes (p. 187). Apply with a broad, flat wash brush.

2. *For Practical Purposes*

(*a*) Poor or faded pictures and spots on the wall can be touched up with good effect.

(*b*) Walls can be easily done over by the older children in ordinary calcimine.

b. Kinds; Sources; Prices

1. *For Art and Construction Work*

The following preparation and colors are best; they can be purchased from local dealers or from the manufacturer. Only strong colors should be used. The original colors can be combined to make other shades. Approximately two pounds of each color is the amount for the first purchase; five pounds of each will supply two or three grades and will keep indefinitely till needed.

(*a*) "Dry Positive Colors" (Alabastine Company, especially recommended, cost about 35 cents a pound (20 to 40 cents according to color). Colors are represented by numbers: 2 (blue); 9 (red); 16 (green); 15 (orange); 1 (yellow); 7 (black).

(*b*) "Calcimo" (Muralto Company) is also satisfactory; the price averages about 40 cents a pound (20 cents to 70 cents, according to color). Colors are numbered K (blue); I (green); A (yellow); E (red); R (brown). Then there are black and white.

(*c*) "Dry colors," made of a very concentrated coloring powder and averaging 30 cents a pound (6 to 90 cents, according to color), are often needed. Colors and amounts suggested are: chrome green and burnt sienna or umber, two pounds each; chrome yellow, cobalt or ultramarine blue, and vermilion red, one-half pound each.

2. *For Practical Purposes*

Ordinary calcimine to be had from a local dealer or a mail-order house at low cost, is used for walls.

c. Suggestions

1. *To Mix*

(*a*) Use hot or cold water as directed — the directions on this point are important — and stir well.

(*b*) Keep the liquid as well as the powder in glass jars.

(*c*) For most kinds of work have the mixture about the consistency of thin cream.

(*d*) Test for color; this fades as it dries.

(*e*) For most work prepare the mixture in small quantities, since it soon sours in liquid form.

2. *To Size*

Some sizing is necessary to make dry colors and ordinary calcimine permanent.

(*a*) $1\frac{1}{2}$ teaspoonfuls of mucilage or one teaspoonful of liquid glue to one quart of liquid color is approximately the right measure.

(*b*) Purchased sizing is used according to the dealer's directions.

3. *To Use*

(*a*) Calcimine is not good for permanent handwork, since it rubs off and quickly becomes shabby. Objects colored with it cannot be handled; this is especially true of wood and clay. Pictures painted with it cannot be piled on one another unless plenty of sizing has been used.

(*b*) For use on walls, follow carefully the directions on the package, or get expert advice.

(*c*) Brushes are an important item; always wash and dry them after they have been used.

(1) For painting, a round brush is used.

(2) For other use a flat 1 to 2-inch brush will serve.

(3) For wall calcimining a 6 to 8-inch brush is best.

CEMENT OR CONCRETE

Portland cement has many and growing possibilities. It is easily mixed, works out successfully after a few trials, can be colored if that is desirable, and produces rather

wonderful results at small cost. Even the young children can use it. Color adds greatly to charm of the work. An improved quality of cement opens up new kinds of work.

Teachers are urged to try some form of cement work. The material has been used most successfully by some teachers, particularly in the rural schools, where real needs are so numerous and practical results so valuable.

a. Uses

1. *For Practical Purposes*

(*a*) Real work out-of-doors, such as making paths, copings, floors for the quarters of pets, a base for a sand pile, or a pool for fish, can be done by the older children.

(*b*) An aquarium (p. 18), a bird bath (p. 15), flower boxes, book ends, and a sundial (p. 29) are also made by them successfully.

2. *For Art and Construction Work*

(*a*) Beautiful artistic bowls, jars, reliefs, and other objects can be made from cement. Color is used with most of them (see *Color Cement Handicraft*, Lemos). This work, however, is very complicated and is not usually practical for the children. They should attempt only very simple pieces.

(*b*) Toys and playthings (p. 194) — that is, small blocks for building, animal outline toys, toy fireplaces, and tiny houses for use in set-ups — are easy for the younger children to make, since clay or cardboard forms may be used. Color with "Petroma" if desired.

b. Sources; Prices

1. *Cement*

Portland cement can be procured for a few cents a pound from any building-supply firm, often from a general country store, or from builders, contractors, or farmers. Sometimes left-over cement will be donated. (Test for condition.) A finer quality can be purchased from art stores and school-supply firms.

2. *Coloring Materials*

Mineral colors are best for coloring cement work. They are to be obtained from paint stores, from some school-supply firms,

or from art dealers. Send for booklet and prices. Petroma is the trade name for a certain make which is satisfactory.

3. *Forms; Molds*

(*a*) Larger forms for practical work are made of ordinary lumber obtained from any source.

(*b*) Smaller forms are made of other material:

(1) Plaster of paris (p. 106).

(2) Wooden boxes, tins, and jars of all sizes can be used if they open at the top and are well greased so that the object can slip out.

(3) Paper boxes may be used for making small blocks and other little objects and toys.

(4) Pieces of linoleum tied together make a serviceable mold.

(5) A strip of tin, about $1\frac{1}{2}$ inches wide, as long as needed, bent into the outline of an animal, a man, or some other object and placed on tile or clay, provides a good form for sand-play toys (p. 194).

(*c*) Large forms for practical work may be of rough wood, but those for finer work or for small pieces should be smooth. Line the form with plasticine, if necessary.

c. Quantity

Cement does not keep well, so it should be purchased in small quantities, as needed.

d. Suggestions

1. *To Test*

(*a*) Fresh cement is smooth and slippery in feeling, with no cakes or lumps.

(*b*) Satisfactory sand for handwork should be clean. Place a 4-inch layer in a quart jar, fill the jar with water to within 3 inches of the top and cover it tightly; shake it well, then let the mixture settle. If the resulting sediment is one-half inch thick, the sand should not be used.

2. *To Use*

(*a*) In this kind of work follow the directions exactly. They

will be found in United States bulletins and in booklets sent by dealers. F. B. No. 1279. *Plain Concrete for Farm Use*, from the United States Department of Agriculture (5 cents), gives full information about mixing and casting. *Color Cement Handicraft* (Lemos) gives the art side and full directions for work. Any manufacturer of Portland cement will send an advertising booklet that contains useful material.

(*b*) Try out a small amount first and make small easy things, such as blocks, outline toys, or plain tile.

(*c*) If a large piece of work is to be undertaken, get an expert's advice as to the richness of the mixture and its proper proportions and also as to the making of forms.

(*d*) Do large outdoor work rather than attempt artistic color pieces.

CLAY

(See also Plaster of Paris; Cement)

Clay is a very valuable material, for it can be used in any kind of school by any teacher, since following a little system makes the giving out and putting away easy, and the expense is not great even when the clay must be ordered. It is especially good material for individual expression and creative work, because it responds readily to manipulation by small fingers, and so mistakes can be promptly corrected and failure changed to success. Clay work may be permanent or temporary. Since it can be done quietly and requires very little supervision, overcrowded schools find it most helpful.

a. Uses

Clay is used in the following as well as in many other ways:

1. *For free play* (especially with little children).

2. *For illustration work* of all kinds — that is, people and animals for "set-ups"; nature reproduction — vegetables, fruits, nuts, leaves, seed pods; Indian beads and pottery; small objects for the doll house; relief maps.

3. *For art work*, such as tiles, bowls, candlesticks, relief friezes, plaques, and busts.

4. *For practical objects*, such as marbles, tiles for the playhouse, bricks for the chimney, and dishes.

b. Kinds; Prices; Sources; Amount

Clays are natural and artificial, and there are several substitutes:

1. *Natural Clays*

These are best for most uses and are the cheapest.

(*a*) If the local soil is of clay, the supply is directly underfoot. Clay dug from a ditch or a cut is usually better than surface clay; at least it is cleaner and finer in grain. Local clays, however, are often too full of sand to use for most work in school, so care is needed.

(*b*) Clay (ground, ready for use) can be bought from a brickyard, a crock factory, or a pottery. That from a brickyard is cheapest, and unless the use is for kiln work (which is seldom) it serves every school need. Such clay costs from 50 cents to $2.50 per one hundred pounds; carriage extra.

(*c*) A clay flour, to be mixed by the teacher, comes from school-supply firms, and is suggested for use if the other clays are not available. The cost varies from 6 to 10 cents a pound; carriage extra.

(*d*) About one hundred pounds of ready-to-use clay or thirty-five to forty pounds of clay flour are needed for a year's supply.

2. *Artificial Clays*

(*a*) Self-hardening clays come from any school-supply firm; they are expensive and not often needed.

(*b*) Oil mixtures, which remain moist, come from school-supply houses. A pound or two is useful to have on hand, but not necessary.

3. *Clay Substitutes*

Clay substitutes are also useful where it is not possible to get real clay. The best is a salt and flour mixture (two cups of salt, a cup of flour, a cup of water). This is good for temporary use only, since it melts when kept.

c. Suggestions

1. *To Order* (see also, pp. 318–321)

(*a*) Specify ground clay, ready for use, unless clay powder is to be used.

(*b*) Several grades should order together, for freight expense is a large item, and the houses make no reduction in price where small quantities are ordered.

2. *To Mix*

(*a*) Clay must be powdered or in very small pieces. Add a little water at a time and mix the preparation as though it were bread. Knead till the mass is smooth and wax-like and does not stick to the fingers. If it is too wet, wrap it in a thick cloth and pound it till the surplus moisture is gone.

(*b*) Shape the substance into bricks and pack them evenly in a can. Slice the material with a string as it is needed from time to time.

(*c*) Partly dried or stiff clay may be reworked by wrapping it in a wet cloth till it is soft and then kneading or pounding it till it becomes smooth.

3. *To Care For*

(*a*) Keep the clay in any air-tight container. Clay bins are expensive and are not necessary.

(1) Any large can or jar with a close-fitting top (a galvanized garbage can; a lard, oil, or peanut-butter can made of tin, or a tin cracker box, or a crock) will serve.

(2) Two cans, one for daily supply, one for reserve stock, are best.

(3) When a tin receptacle is used it must be painted inside and out to prevent rust.

(4) Cover the bottom of the container with a two-inch layer of mixed plaster of paris; keep this damp, and the clay will remain in perfect condition. (See Recipe for mixing plaster of paris, p. 107.)

(*b*) Keep the clay damp.

(1) Punch holes in the mass with the thumb, and fill the holes with water

(2) Keep the can covered.

(3) Remember to keep the plaster-of-paris bottom moist — with no pools or puddles on it — and a wet cloth spread over the top of the clay.

(4) Always examine the material the day before it is to be used.

(*c*) Never throw scraps of dry clay or of old models into the can; soften and work them into shape first. Always have the children gather up the left-over pieces at the end of the work and put them into good condition before replacing them in the can.

4. *To Use*

(*a*) Cover the desk or the table with newspapers, which can be destroyed at the end of the work hour. This saves time and trouble. Oilcloth and special clay boards are not needed.

(*b*) Clean the hands after work with wrapping paper or cheap toilet paper that has been dampened.

(*c*) If finished work is to be kept, put it in a safe place. Clay is easily broken.

(*d*) Do not destroy work that has just been finished by little children, and do not let them destroy it. If they feel that their effort is of no value they lose confidence in themselves. Older children, who have a better sense of values, may restore their clay to mass form after using it for temporary modeling.

(*e*) Unless there are lockers and bins for the clay, a given piece of work should be finished in one or two days. Clay hardens quickly, unfinished work gets in the way, and accidents happen. A wet cloth will keep the material in shape for a short time, particularly if the work is placed on damp tiles made of plaster of paris.

(*f*) Clay objects can be colored with calcimine, water color, or enamel paint. If painted with enamel paint or shellacked, fairly usable bowls, jars, and small trays can be made without firing. After a bowl has been painted, a film of paraffin on the inside makes it water-tight.

(*g*) Clay things may be fired, with more or less success, in the school stove, or out-of-doors in smoldering fires — after the method of the primitive people — or in kettles. Winslow's *Elementary Industrial Arts* gives full directions.

(1) The clay must be of good quality, well mixed, and the objects well made if they are to be fired.

(2) Marbles, bricks, tiles, and thick shallow bowls are made most successfully.

(3) Handles always fall off.

(4) Clear coals are best to start with. Make a nest of coals, and put the piece in. Then cover the whole with more coals.

(*h*) Let the children work where they choose, at a table, on the floor — anywhere. Clay boards are of help here, since they can be used indoors or out.

(*i*) Of course the children always give out and gather up the material, and clean up.

(*j*) Let each child work in his own way and express his own ideas without formal directions.

(1) At first he will test the material, pound, punch, and roll it. This must be allowed for a time, though not for too long.

(2) Next he settles on a definite purpose, his own or one suggested to him: he decides to make a rabbit, or a dog, or a vase. By degrees, as he sees more clearly and gains in skill, he expresses this aim in better and better form.

(3) The teacher's hands stay *off* the work.

(4) The worker compares his effort with the real object and notes the good and bad points of the work, perhaps under the teacher's suggestion.

(5) Later he may be told how the Indian squaw made her bowls or how the potter turned his wheel; or he may be shown a Greek bas-relief, or a tile with a fine design.

(6) For making casts and molds, and for other more complicated types of clay work, see Bonser and Mossman: *Industrial Arts for Elementary Schools.*

CLOTH

(See also Dyes; Sewing Outfit)

Cloth, old and new, is needed for many practical and educational purposes.

a. Kinds; Uses; Sources

1. *Old Materials*

Materials which will serve many of our school needs are given by parents and friends.

(*a*) Worn sheets, spreads, curtains of all kinds, turkish towels, and old mosquito netting have only to be dyed or fixed over to provide gorgeous material for costumes, background curtains, and other needs in connection with staging plays (pp. 189–191).

(*b*) Worn and faded clothing, knit underwear, and hose can also be dyed and worked over for costumes or torn into strips for weaving rugs and for other work.

(*c*) Scraps

(1) Are useful for dressing dolls and figures for the models and "set-ups."

(2) Furnish upholstery, etc., for the doll house, and provide play materials.

(3) Are of aid in making Christmas gifts.

2. *New Materials*

New materials are needed for some purposes. If they are to be dyed or washed, allowance must be made for shrinkage.

(1) Heavy chambray, denim, or drill, in dark colors is needed for work aprons and school bags.

(2) Coarse-weave material for Christmas work is sometimes desired in connection with cross-stitching, blanket-stitching, or hemstitching and for other easy sewing or embroidery.

(3) Cheesecloth, or unbleached muslin, is the best material for costumes: it is soft and light and dyes beautifully. Mosquito netting is also attractive. These materials can be purchased by the piece at low prices.

b. Suggestions

1. *To Purchase*

(*a*) Buy materials as they are needed; have the children estimate carefully the amount of material required for a given purpose.

(*b*) The children pay for personal materials, and the school for costumes and for other things that are to be kept by the school.

2. *To Collect and Keep*

(*a*) Keep a box of well-selected scraps in every cupboard.

(*b*) Collect most material as it is needed. If it seems best to keep a large stock of pieces and garments, fold them flat and tie

them in bundles. Label the bundles and, if school storage space is not to be had, store them at the home of the teacher or of some parent.

COMPOSITION WALL BOARD

(See also Wood)

Composition board ("compo," "beaver," "plaster," and others) commonly used as building material has many school uses. It cuts more easily than wood, is lighter, and makes a good substitute for some woodwork. When painted and varnished it is waterproof.

It costs about 5 cents a square foot, in panels of 36 to 40 inches wide and 3 to 12 feet long, and can be bought from any local building-supply firm. It has been used successfully for mounting large pictures (p. 253), for screens (p. 301), for drawing boards (p. 117), for a collapsible screen playhouse (p. 195), for bulletin boards (p. 306), for partitions, for floors and walls in a doll house (p. 196), and for shelf partitions (p. 335), as well as for many other purposes.

CRAYONS; CHALK; CHARCOAL

a. Wax Crayons

Wax crayons are needed in every grade, especially by the primary children.

1. *Large Crayons*

The primary grades, first to third, should use only the large "first-grade crayons." They last longer and are much easier for the children to grasp and hold.

(*a*) These cost about 35 cents the dozen or 3 cents each, or $4 a gross from the Binney Smith Company, and come in eight colors.

(*b*) A full set of eight colors is desirable for each child. A set of four — red, orange, green, and blue — for each two children, and a few extra brown or black crayons, is the minimum supply.

(*c*) Give the paper wrappers two coats of shellac, and the crayons will not break so easily.

(*d*) Sort the crayons and keep them in sets in small boxes, which should be packed in one large box.

(*e*) Have the children buy their own crayons if possible. If the teacher requests it, local dealers will keep the large ones in stock, in the desired colors.

2. *Regular Crayons*

Grade children use any good crayons of the regulation size. Dixon crayons are especially recommended, to be had from J. L. Hammett or from Dixon. Prices vary.

b. Charcoal

Charcoal is excellent for rapid drawing, to show action or to give quick effects, but without a fixative it rubs off and cannot be used for permanent work.

A box of charcoal, liberal in amount, can be bought for 75 cents from any school-supply house.

c. White Blackboard Crayons

White blackboard crayons on dark paper give good snow pictures and silhouettes, and serve to soften the colors of wax crayons in other drawings.

d. Colored Blackboard Chalk

Colored blackboard chalk also gives good rich colors for drawing on paper in temporary work, as well as for blackboard drawing.

A box of assorted colors costs 25 to 75 cents a box, and should be included in a supply list. Any school-supply house carries this chalk.

e. Fixative

If the above drawings are to be kept, a fixative is needed. It can be purchased from any school-supply company. The fixative is used with a spray; the two should be purchased together.

DYES

(See also Cloth)

Dyes are needed for many types of handwork.

a. Uses

1. *For Cloth, Old and New*

(*a*) The costume problem (pp. 187–191) is solved by dyeing old curtains, dresses, spreads, sheets, suits, underwear, stockings, and other faded or worn material, and new cheesecloth — or unbleached — where required. An old marseilles spread, roughly darned and dyed orange red, made a gorgeous background curtain for a play, and a faded cretonne curtain dipped in red made a queen's robe of gay flowered stuff. Costumes for a pageant were made from unbleached muslin and old white socks and stockings dyed every shade and color. It is not often necessary to boil the material; dipping is usually best, since permanent effects are not required. Uneven dyeing is more effective than flat, even color. Dipping in two colors, one after the other, gives a much better effect than using a plain dye; if the desired color is purple, for example, dip the material in blue, then in red.

(*b*) Scraps of cloth for dressing dolls, for furnishing the doll house, or for use in illustration work, are often colored.

(*c*) Sometimes materials such as cloth and yarn, to be used for rugs or for Christmas handwork, are dyed. Here boiling is necessary.

(*d*) Tied and dyed work and other fancy dyeing are done occasionally by older children.

2. *For Other Material*

(*a*) Basket grasses and splints are colored by soaking them in strong, hot dye. Sometimes it is necessary to boil them. Use only real dyes.

(*b*) A strong dye rubbed into new wood stains it well. It is easy to use on toys, on furniture for the doll house, and such things. The articles must be finished with shellac or with wax.

(*c*) Cheap papers can be colored in many beautiful shades. (See Paper.)

(*d*) Certain dyes make satisfactory substitutes for water-color paint in the work of the older children. Bluing, strong solutions of any dye powder, poke berries, and walnut juice are good. Keep the liquids in small, wide-mouthed bottles.

b. KINDS; SOURCES; PRICES; AMOUNT

1. *Commercial Dyes*

There are many excellent commercial dyes which are satisfactory in school work, especially for wool, silk, cotton, and linen. Dipping gives light colors; for strong, lasting colors, boiling is needed.

(*a*) The *salt dyes* are the most permanent. These come by the pound or package at moderate cost. Sunset, Putnams, Dainty, Diamond are all good. Rit and Tintex are good for dipping material of light color. Satisfactory colors are rose, red, pink, yellow, orange, green, blue and purple.

(*b*) *Aniline*, a basic dye, gives clear, strong color and is best for stage costumes. The colors fade quickly in the sunlight, however, and so the material treated can be used for only night performances — or at most once or twice in daylight out of doors. The costs vary according to color.

(1) Since these dyes are very strong and concentrated, only a small amount is needed, unless large numbers of costumes are to be dyed.

(2) The Chicago Apparatus Company, Eimer and Amend, and Du Pont de Nemours, will furnish aniline dyes.

(3) One ounce each of the following colors will be enough to start with. (First choice starred):

*Fuchsine Red *Methylene Blue *Auramine Yellow *Auramine Green
Rhodammine Red Victoria Blue *Chrysoidine Gold Victoria Green
Safranine Red Imperial Blue

2. *Substitutes*

Miscellaneous coloring materials are often easier to obtain than commercial dyes and easier to work with; but they are not lasting.

(*a*) Cheap crêpe paper soaked in a small amount of water gives good colors, especially red and blue crêpe.

(*b*) Laundry bluing (the powdered form is best) gives a clear blue in several shades, varying with the amount of water used.

(*c*) Inks — red, green, sepia, purple — mixed with water, can be used as dyes.

(*d*) Coffee and tea give good creams, tans, and écrus.

3. *Nature, or Vegetable Dyes*

These can be obtained from onion skins, walnut hulls, and certain roots, but are usually not practical for the average school — except in experimental work. For definite instructions see Pellew's *Dyes and Dyeing*, also *Classified Furnishings for Primary Grades* (pamphlet 50 cents), Ethical Culture School.

c. Suggestions

1. *In General*

(*a*) This is all experimental work and should be tried out in a small way by teacher and children before they undertake a large task. The selection of the method and the dye depends upon the use and the material.

(*b*) Let the children — the older ones only — work in small groups, out-of-doors if possible.

(*c*) Note the following practical items:

(1) Be sure the dye pot is large enough.

(2) Be sure to strain the dye, whatever its type.

(3) Dye only a few things at a time.

(4) Rinse thoroughly.

(5) Dry the material in the shade.

(*d*) In using commercial dyes follow the printed directions. Dissolve the dye carefully before adding it to the bath. Use hot water, acetic acid, or oxalic acid as directed.

(*e*) Call in experienced helpers (mothers or friends) when costumes for a pageant or a play are to be dyed, and do this work out of school hours. The children help, of course.

2. *In Particular*

(*a*) Aniline dyes are in a special class. These dyes go directly into wool, silk, feathers, and leather, but when they are to be used with cotton material, first dip the goods in a wash solution of cotton dye and then use a basic dye. The dye should be dissolved in a little acetic acid, then hot water is added for the dye bath. For feathers, oxalic acid is used to dissolve the dye. If the color is not satisfactory place the material in the sun till it fades, then re-dye it.

(*b*) In dyeing materials for costumes or stage settings, each

color will be much more effective if it is made by combining other colors — purple, for example, is obtained by dipping the material first into red dye, and then into blue, instead of using plain purple. Uneven dyeing, also, is most effective.

3. *Special Directions*

(*a*) For fancy dyeing (Batik and tied-and-dyed work, for example), see books and advertising materials, as those of the American Dye Corporation.

(*b*) For industrial dyeing, see Bonser and Mossman: *Industrial Arts for Elementary Schools.*

(*c*) For dyeing paper, see Paper (p. 102).

(*d*) For costume dyeing, see Grimball and Wells, *Costuming a Play.*

FASTENERS; STICKERS

1. *Sealing Tape*

Sealing Kraft tape (brown gummed paper) is a school necessity.

(*a*) It is used for construction work and for many practical purposes.

(*b*) It comes in two weights and in one-half, three-fourths, $1\frac{1}{2}$, and 2-inch widths, and costs from 20 to 75 cents for a roll of eight hundred feet. This roll lasts almost indefinitely. The tape is used in many general stores for fastening packages and can be purchased there or from book stores, or from J. L. Hammett.

(*c*) A roll of the 1-inch width will serve, but it is desirable to have also a roll of the 2-inch width.

2. *Surgeons' Adhesive Tape*

This tape, 1 inch wide and at any cut-rate drug store 35 cents a roll, is excellent for fastening things which require a strong binder.

3. *Thumb Tacks*

"Common stamped" thumb tacks, 100 in a 30-cent box, come from Milton Bradley or from Hammett. One or two boxes are required.

4. *Cigar Nails*

Cigar nails, size three-fourths inch with head, for nailing

small pieces of wood together (as for toy furniture and other toys), one box 10 cents.

5. *Nails; Bolts; Screws*

About ten pounds of assorted nails with heads for woodwork, and three pounds of screws and bolts should be kept on hand. These cost a few cents a pound at any hardware store.

6. *Carpet Tacks*

A box of carpet tacks and brads (5 cents) is needed.

7. *Paper Clips*

One box of paper clips for holding papers and other things temporarily together, five cents a box at a ten cent store, or from a school-supply house.

8. *Snapper Clothespins*

Snapper clothespins for holding drawings, booklets, and the like, temporarily together and for keeping glued material in place. Box containing three dozen from a ten cent store, 10 cents.

INKS

a. Drawing Inks

These come in beautiful colors, and in gold and silver, as well as in black and white, and cost 25 cents for small (regulation) size containers, $2, $7.25 for larger containers. Higgins's Waterproof ink is recommended. From any bookstore or school-supply firm.

b. Printers' Ink. (See also Linoleum, Sandpaper, Carving Tools, and Roller.)

1. *Uses*

Printers' ink is used for making block (p. 85), sandpaper (p. 108), leaf, and other prints.

2. *Kinds; Sources; Prices*

These inks can be obtained in many brilliant colors as well as in black.

(*a*) Special colored, gold, and silver inks and dusting powder for fancy work, come in one-quarter-pound tubes, at about $1.50 to $6 per pound, from Philip Ruxton, Inc.

(*b*) Other black and colored inks and dusting powders, at about $1.50 per pound, can be had from Kelsey Press Company.

(*c*) Black printers' ink for general use should be purchased from local printers in small amounts, or from any of the above places.

(*d*) Printing dyes for block printing are furnished by the Waldcraft Company in $1\frac{1}{2}$-ounce jars, 53 cents each, in various colors. A set of eight colors costs about $2.80 (Hammett)

3. *Quantity*

No definite amount can be suggested, but since for school purposes a small amount of ink goes a long way, one-quarter-pound tube of any color is, as a rule, sufficient.

LEATHER

Leather is needed occasionally by the older children for craft work and bookbinding. It has special possibilities in rural schools.

a. Uses

Bags, portfolios, cases, book covers, and other articles can be made.

b. Sources

Leather can be purchased already tanned, by the whole skin, or in small pieces; or raw skins can be tanned by the children.

1. *Tanned Skins or Finished Leathers*

(*a*) Can be purchased from a local tannery, from A de Jonge, Gaylord, Holliston Mills, or any book bindery.

2. *Directions for Tanning Skins*

Can be obtained from:

(*a*) Bonser and Mossman: *Industrial Arts for Elementary Schools.*

(*b*) Leaflets of the Industrial Arts Coöperative Science.

(*c*) Leaflets of the Bureau of Home Economics of United States Department of Agriculture, Extension Department. These leaflets are planned for adult work but are also very helpful to teachers.

(*d*) Bulletins of the Junior Achievement Bureau.

LINOLEUM

(See also Tools, Press; Inks, Paper)

Linoleum serves a number of practical school purposes (pp. 282, 305) and also is a valuable constructive material as a substitute for wood in block printing, since it is much easier to work with than wood, and to print. Any school can do some linoleum work in the upper grades.

Printers' ink (p. 83), a hand roller (p. 119), some method of printing (pp. 86, 123), tools for carving (p. 124), and paper (pp. 98,99) are also needed.

a. Uses

The children of the upper grades can make charming and artistic prints for booklets, illustrations, cover designs, Christmas cards, invitations, and nature work, and can also decorate costumes and fabrics for scarfs, table covers, and other uses.

b. Kinds; Sources; Prices

Any small pieces of linoleum will serve; the color and pattern do not matter. Usually these pieces will be donated or sold at remnant prices. School-supply houses carry linoleum cut in suitable pieces.

c. Suggestions

1. *To Select Materials*

(*a*) Any kind of paper for the prints can be used with black ink.

(*b*) When colored ink is used a finished paper is best, since a soft, porous paper often absorbs the ink and makes the pictures dull.

(*c*) The surest way is to use brilliant tone papers and black or contrasting ink.

2. *To Make Designs or Pictures*

As a rule, the design should be original. Begin with a bold mass outline which requires few cuts. Later, as the hands become more skilled in making delicate cuts and lines in the linoleum, the designs may be quite intricate.

3. *To Make Block*

(*a*) Cut the linoleum to the proper size.

(1) Draw the picture or design directly on the linoleum or transfer the drawing (carbon paper) from paper.

(2) Then with a knife or a gouger or a safety razor blade (*one* edge) cut away all the part which must not show on the print, leaving the picture or design in relief, or standing up from the rest. Go slowly and cut carefully around the edges so that the line will be clean and clear.

(*b*) If the printing is to be done on a printing press, glue the linoleum to a wood block so that the whole will be as thick as a type holder and type. If a vise, a letter press, or a clothes wringer is to be used, leave the linoleum as it is.

(*c*) If the block is to be used for stamping or printing on cloth by hand, glue the linoleum to a thick piece of wood of the same size, so that it may be grasped easily and pressed firmly.

4. *To Print on Paper*

(*a*) Use printers' ink. Put a small amount of ink on a flat piece of marble, glass, or slate and run a small hand roller over the piece till the roller is well covered. Then run the roller over the cut-out picture till it is well inked. One good inking should make twenty to fifty copies.

(*b*) Print as follows:

(1) In a printing press. Print as any other work.

(2) In a vise or a letter press. Lay the paper on a block and on top of this place a piece of wall board or of wood, larger than block, to make pressure even; put all in the vice or the press and give a quick, tight pressure. Remove the paper impression and continue process till the required number of prints are made. If the impression is dim, add more ink, or greater pressure, or both. It takes several attempts to get good clear prints.

(3) In a clothes wringer. Adjust any ordinary clothes wringer so that the linoleum block will go through the rollers. Lay the paper on a block and run it through by turning the wringer.

5. *To Print on Cloth*

(*a*) Stretch very tightly over a thick pad the fabric that is to be printed. Fasten down with thumb tacks.

(*b*) Dip the block print into very thin oil paint and press it firmly on the material. Repeat as necessary.

MISCELLANEOUS MATERIAL

a. Asbestos

Asbestos paper or board is sometimes needed. This comes from the Chicago Apparatus Co. in several grades and in thickness from one thirty-second to one fourth inch. No. 30W (.03 inches thick) costs 30 cents a square yard. No. 35W costs from 15 cents to $1.10 a square foot.

b. Book Cloth and Leathers

Buckram book cloths, book leathers, and leatherettes come in beautiful colors and texture and are used for many forms of craft work. They can be bought by the yard or the foot according to the material. The Holliston Mills has a full stock at reasonable prices — for example, library buckram, 36–50 inches wide, costs 52 cents the yard. Gaylord also has this material.

c. Celluloid

Transparent celluloid in sheets twenty by fifty inches comes from Gaylord at $1.35 a sheet, or may be purchased in smaller pieces. It is used for windows, doll houses, puppet shows, valentines, and other work where transparent paper or glass is needed; also for protecting specimens and pictures (p. 239). Very thin celluloid paper comes wrapped around candy boxes. Save this. Celluloid is very *inflammable;* never use it near a fire.

NATURE MATERIALS

Rural and village teachers should have the richest and fullest of all school life with their children. Farms, fields, and woods, gardens, streams, open roads, not only furnish real experiences and beauty of outlook (p. 159), but are a wonderful source of work material as well.

a. Kinds

The following, and many other kinds of nature material, are good to use with children.

Leaves	Clay	Corn husks (shucks)
Seeds	Sand	Corn silk
Bark	Pebbles	Cornstalks

Twigs, wood	Shells	Vegetables
Moss	Straw	Gourds
Nuts	Grasses	Grains
Pine cones	Flowers	Wool
Honeysuckle vines	Cotton	Flax

b. Uses; Sources; Cost

Nature material can be used for play (p. 187), industrial art work and illustrative work. It comes from sources nearest at hand, and is free to the collector, each community yielding its special products.

1. *Industrial Materials*

(*a*) Nature dyes are plentiful (p. 81).

(*b*) Hickory or oak splints, willow twigs, heavy barks, pine needles, corn husks, honeysuckle vines, and grasses of many kinds make charming and useful baskets.

(*c*) Cotton and flax from the field and wool from the sheep's back may be brought directly into the classroom for weaving, spinning, and carding.

(*d*) Corn, wheat, oats, and other grains may be gathered for grinding and cooking.

(*e*) In the study of foods, vegetables from the garden and berries and nuts from the woods and fields are dried, preserved, or cooked for immediate use.

(*f*) Saplings make rustic fences and furniture.

(*g*) Wood and bark are used for carving, building, and other work.

(*h*) Clay is needed for modeling and pottery making (p. 71).

2. *Illustrative Work*

Nature is especially rich in illustrative materials.

(*a*) The action of a stream can be used to illustrate erosion, the building of deltas, the making of dams for water power, and other processes that are to be explained. The bed of a stream gives material for sand tables and sand piles.

(*b*) Earth, stones, moss, vegetables, seeds, cones, burrs, leaves, and hundreds of other objects are used in making scenes, models, and people (p. xxv).

(*c*) Snow and ice conditions, a hillside for cave digging, and low-spreading trees, offer material for building an Eskimo igloo, making a tree dweller's house, and digging a caveman's home.

3. *Play Materials*

These are noted in Play Activities (pp. 187, 193).

c. Suggestions

Encourage the children to bring in nature material that will be useful in working out both individual and group problems.

ODDS AND ENDS

These are collected by the children as needed, to work out ideas and plans of all kinds, and in most cases cost nothing.

(*a*) Catalogues, old magazines, and other advertising material for ordering or estimating, for cutting out pictures to be used as needed in booklets, poster work, and picture collections.

(*b*) Picture post cards, for illustrating geography, science, and other work. Collect the cards through exchange with other children and schools, or as gifts from friends.

(*c*) Yarn, string, cord, for tieing, weaving, and making kites.

(*d*) Corks for floats and water toys.

(*e*) Excelsior, for stuffing dolls, pillows, and mattresses; for use under paper pulp to build up hills and mountains in scenes or on large relief maps.

(*f*) Burnt matches, toothpicks, and hairpins, for making dolls and other figures.

(*g*) Shoe buttons, to serve for the eyes of dolls and animals.

(*h*) Tow sacking, bagging, potato sacks, and old burlap, for making outdoor cushions, covering for outdoor playhouses and large wigwams.

(*i*) Clothespins for dolls, markers, and holders.

(*j*) Meat skewers to be used as mounts for seed markers and for windmills and other wind toys.

(*k*) Building material (pp. 182, 183) (roofing tile, compo board, shingles, fireplace tile, hollow tile, plain or glazed bricks) for many uses in illustrative work and play.

(*l*) Fruit baskets suggest Christmas work.

(*m*) Wooden plates and butter trays, for boats and floating toys.

(*n*) Short pieces of wax crayons, to be melted down for modeling beads or other small objects.

(*o*) Spools to be used for wheels or in making toy furniture, and other playthings.

(*p*) Milk-bottle tops for wheels and toy money.

PAINT (OIL); VARNISH; STAINS

(See also Calcimine, Wood)

Paint and good brushes are expensive, but the expense is well worth while, for the results are permanent, and all children enjoy the work greatly, while the older ones become really expert and after some experience can do many practical jobs around the school building.

a. Uses

1. *For Practical Purposes*

(*a*) Paint often works miracles when used on walls, furniture, shelves, or floor. A room with dingy ceiling and walls, scarred desks, and general ugliness, becomes an attractive and peaceful place (p. xxiii) when everything is pulled together by means of a covering of some soft neutral color, or two tones of such a color. Greens, grays, and browns are best.

A little touching up with paint (window sills, chairs) often greatly improves the appearance of a room.

(*b*) Spar varnish or deck paint, used on play apparatus and outdoor things, helps to preserve them. These paints will also make aquariums and boats watertight, and are good for use on tables and shelves to prevent water marks.

(*c*) Varnish (clear) is used as a finisher for some paints and for stains. Sandpaper to remove a high gloss.

2. *For Arts and Constructive Work*

(*a*) Flower and fern pots (p. 164), jars and book ends (p. 215), painted in bright shades — yellow, delf-blue, orange, green — add life and attractiveness to a room, provided the proper

colors are chosen. Be careful to use a good color. Do not paint glass.

(*b*) Children's work — including toys, wagons, doll houses, and furniture, bird houses, and other large objects — often requires painting, especially if the things are to be used outdoors.

b. KINDS; SOURCES; COST

1. *Paint*

Good paint should be used for permanent work. Any good make is satisfactory. Cheap paint serves temporary uses, as for a play village or a doll house. Purchase as needed from any paint store, mail-order firm, or ten cent store. Do not keep in stock unless necessary.

(*a*) Enamel paint is expensive. It comes in bright colors and hard finish, and is used on toys and small things.

(*b*) Wagon, bath-tub, and porch paint is much cheaper, has a hard finish, and in most cases may be used instead of enamel.

(*c*) Flat paint has a dull finish and is used on indoor woodwork and furniture.

(*d*) Spar varnish, or deck paint, is waterproof and gives a hard surface.

(*e*) Clear varnish preserves and finishes certain kinds of woodwork.

2. *Stain* (not varnish stain)

Stain (oil or water) may be used for new smooth wood, and is cheaper than paint. Cabot stains are excellent.

3. *Shellac* (p. 110)

Shellac is needed as a dryer and finisher for painted surfaces.

4. *Other Needs*

(*a*) Turpentine is always needed for thinning paint. Keep at least one quart on hand.

(*b*) Kerosene (coal oil) for cleaning, also excelsior, waste paper, and old cloths are needed.

5. *Brushes*

Good brushes are essential to good painting. Purchase from a reliable paint store.

(*a*) For ordinary school use, from four to six each of 4-inch size, two of 2-inch and two of 3-inch size, costing from 65 cents to $1.50 each are needed.

(*b*) For real work (furniture, woodwork) the following are recommended.

(1) In outside painting use the "6–0" (six-naught) round or oval brush, also known as the "pound brush," for body colors, the "5–0" brush for trimming colors.

(2) For varnishing use a good 2″ fitch flowing varnish brush.

c. Suggestions

1. *To Mix*

(*a*) Thin the paint with turpentine. It goes further then, is smoother, and dries more quickly. This is especially true of cheap paint.

(*b*) Stir the paint well each time it is used, going to the very bottom of the can. This takes a long time, but it is very important, especially in mixing colors.

(*c*) Mixing special colors is difficult and often expensive. Get help in this from an expert or else experiment first with calcimine. Always mix enough right at the start for the entire job since it is hard to duplicate shades.

(*d*) If a small amount each of several colors is needed, get white paint and small tubes of artists' oil paints, and add various quantities till you have the desired shade. This is very simple, not like the combining several colors for a new color. Dry colors (p. 67) may also be used.

2. *To Use*

Painting is mussy though joyful work, and it needs careful handling, especially with the younger children.

(*a*) Prepare for painting as follows:

(1) Have the brushes clean, and remember that brushes used in dark paint must be thoroughly cleaned before they are used in light-colored paint, or streaks will show, and the work will be spoiled.

(2) Have the paint well mixed. Divide the amount and put it into several small cans.

(3) Have plenty of waste paper and a few old cloths to clean with and for protection.

(4) Tell the children to wear old clothes or — preferably — aprons.

(5) Do the painting outdoors when possible, but if the work is done indoors use newspapers lavishly for protection on tables and desks, on the floor, and along walls.

(*b*) Paint with a swinging motion, going well back at each stroke, to prevent brush marks. Follow the grain of the wood. A little practice brings good results. Do not press on the brush.

(*c*) Manage the children's painting as follows:

(1) Let only a few children work at once, two or three primary pupils (carefully supervised), and five or six of the older pupils. The latter should do pretty good work and after a little experience will probably need less watching.

(2) Have the children who are not actually painting sit down (unless they are waiting their turn) to other work. Running around means disturbance, spilled paint, and spoiled clothes.

(*d*) For good results remember:

(1) That the surface to be painted should be as clean and smooth as possible. Sometimes it is necessary first to remove old paint and varnish. The children can do this by rubbing the surface with coarse sandpaper folded over a small block. Grown-ups may use varnish removers or lye; children should never do so.

(2) That stain can be used only on smooth, new, well-finished wood. Put it on with a brush, rub hard with a cloth, keeping the brush in one hand and the cloth in the other for quick work. Wax later. Very thin paint can be used in the same way and gives lovely soft colors. Be sure to apply the paint evenly and to rub the surplus off quickly and vigorously. Practice on scrap wood before treating a real piece of work.

(3) That paint will go on old wood and rougher pieces; it should always be chosen for use where there are both old and new things to treat.

(4) That the free use of some drier, such as shellac, is usually needed; it hurries up the work.

(5) That if painting is done on Thursday and Friday there will be less time for the fresh paint to be a nuisance. A first

coat Thursday, a second coat Friday, and by Monday the paint will be well dried.

(6) That a dry, warm day is much better for painting in than a damp one.

(7) That each coat should be thin, well brushed in, and thoroughly dry before another coat is applied.

(8) That a thick, heavy coat of paint always blisters, peels, and looks unsightly.

3. *To Keep*

(*a*) Paint should always be kept in a tightly sealed container when not in use, because otherwise the oil will dry out and a thick scum, or skin, will form on the surface. When the scum gathers it must be scraped off before the paint can be used again, and that makes the paint lose much of its quality. Oil or turpentine poured over the surface of the paint will prevent its drying.

(*b*) Never allow a brush to stiffen with paint. Brushes for paint, varnish, or stain must be well cleaned after they are used, if they are to be put away, though for merely keeping overnight it is generally sufficient to wrap them in several thicknesses of paper. Some painters keep their brushes overnight by putting them in water; they hang them on a nail just above the cans, with only the bristles immersed. Turpentine is best for cleaning brushes, but it is expensive. Kerosene, which is much cheaper, will serve. After the paint has been washed off with kerosene, the brush should be rinsed in gasoline or benzine, then thoroughly shaken and well-washed with soap and warm water. After that it should be shaken thoroughly, in order to throw as much water out of it as possible, and hung up, bristles down, to dry.

(*c*) Brushes used for shellac must be washed in alcohol.

(*d*) Never allow the brushes to stand on end, or the bristles will be ruined.

4. *To Do Real Painting*

When real work is planned, and there are such problems as painting over old paint, removing varnish, and covering dark paint with light color, consult an expert or see books on painting. Paint stores and manufacturers will send out printed material on request.

PAPER

Paper is used for writing, drawing, painting, for making posters and charts, and for many forms of constructing, both practical and educational. All sizes, textures, and colors fill some need.

It is especially important that large pieces, at least 24 × 36, are in stock for drawing, painting, posters, charts, and writing, and long strips are convenient — though not necessary — for borders, friezes, and "movies."

Plain, medium weight, dull surface paper, in Manila, cream, or soft gray, are needed for such work as drawing and painting.

Brown or tan paper, heavy weight, has many uses in constructive and art work.

Colored papers are needed for decorative art work, especially cutting which is so important for little children and which lays the basis for drawing and painting. Special papers for cutting, construction, and booklets are needed at times.

a. Kinds; Sources; Uses; Prices

1. *Free Paper*

This is collected in many ways. The children help by saving the better pieces of paper and cardboard that they find at home. A local store will give waste paper as well as boxes, if some friendly clerk can be interested. The county newspaper or a print shop will have usable odds and ends. Getting material free is more trouble than buying it and requires persistence at times, but it saves much money that is needed for other things, or it helps a school to get along without money.

(*a*) Used wrapping paper (all colors and weights) and the heavy (bogus) grayish paper which comes as padding around books and other large packages, may be used for cutting, drawing, booklet-making, constructing — according to the type of paper.

(*b*) Out-of-date wall-paper sample books and left-over rolls of wall paper are fine for school use.

(1) The wrong side of wall paper has a good surface for drawing and painting, and the pieces are large enough for big free work.

(2) In plain colors the right side is often as beautiful in texture and tone as the expensive art papers and most satisfactory for free cutting, which has an important place in art training.

(3) The figured patterns are used to cover boxes and booklets and to provide "cut-outs" for posters, picture books, and decorations for costumes.

(*c*) Black paper from kodak films and white paper from ribbon rolls (the wider the better) are used for:

(1) Silhouette figures and mounts, and also for free cutting and art work.

(2) Folders (like folding post cards) illustrating nature studies, geography, and history topics.

(3) "Movie films" (as long as needed), with figures drawn or pasted on, shown by being wound slowly from one roll to another across a toy stage.

(*d*) Used blue prints in large sheets are good on the reverse side; they will be given by contractors and builders.

(*e*) Backs of catalogues and advertising folders are often of beautiful color and texture and will provide small pieces for cutting.

(*f*) Tissue paper and crêpe paper dress dolls and figures, help furnish the doll house, cover peep shows and boxes, make flowers and decorations for costumes, and are used in poster work and other cutting.

(*g*) The printer's shop donates mussed paper and cardboard, and cuttings and scraps of many kinds of bright-colored paper.

(*h*) Old newspapers are stand-bys; they protect floors, desks, and tables, make good paper pulp, cover kites, and make caps and sleeve protectors. They make also temporary aprons which are really quite practical. To make an apron use two papers (double thickness) one for the front and one for the back; tear them out a little to fit neck and arm holes, and fasten them on the shoulders and under the arms with wire clips.

(*i*) Used paper towels and napkins to stuff dolls, make pulp, and to make relief maps.

(*j*) Odds and ends of paper and paper things help the children in working out many projects.

(1) Paper lace is used for doll dresses, valentines, and covers for chairs and boxes. Gilded with paint, the lace makes effective trimming for costumes and crowns (p. 190).

(2) Isinglass and wax paper make windows and automobile curtains.

(3) Cups that have held candy are used by one youngster for dishes, by another for a doll's hat and parasol.

(4) Tinfoil covers silver dishes and bathroom or electric fixtures.

(5) Tablet backs make picture mounts and book covers, and add to the cardboard supply.

(6) Corrugated cardboard is used for play washboards, and when calcimined white, makes fluted columns for a colonial house model.

(7) Ribbon rolls suggest tubs, silos, drums, and fancy boxes, and long cardboard rolls make good posts for houses or fences.

(8) The tops of milk bottles become wheels which really turn.

(9) Picnic plates and cups (p. 186), decorated and having three coats of shellac, are fine dishes for the first-grade play house, for they don't break and they are big enough to seem real.

(10) Scraps of colored letter paper and envelope linings are usable for cutting. Backs of catalogues often provide good-sized pieces of colored paper.

(11) Wax paper makes drinking-cup envelopes, and is also used for drying shellacked articles upon.

(12) Transparent celluloid wrappers from the outside of candy boxes are excellent for making picture holders and windows and for protecting specimens. This material is very inflammable; keep it away from fire.

2. *Commercial Paper*

Commercial papers offer many possibilities for school work.

(*a*) Plain wrapping papers are both practical and economical and can be substituted for the expensive school papers. This

paper is usually graded on a ream weight, regardless of whether it is in roll or ream, i.e., a "45-pound basis" means any paper weighing 45 pounds to the ream of 480 sheets 24 × 36 inches. The large rolls are figured on this basis. The price varies from $6\frac{1}{2}$ to 9 cents a pound, carriage extra. Purchase from any paper dealer. Ask local merchants for the name of the nearest jobber or dealer. Sometimes merchants will order for the school. Always write for samples and prices. G. W. Millar, and Lindenmeyer are large paper firms.

(1) A roll of unglazed Manila wrapping paper, medium weight, i.e., 40- to 50-pound basis (*with cutter*) is strongly advised. While the first cost is a little higher than for other kinds of paper, no other kind goes so far. Once secured in a convenient place on wall, table, or shelf, the paper keeps in perfect condition, cuts neatly in any length, and supplies the large pieces that are so needed in modern work. A roll of this, supplemented by free material, will solve the paper problem in many a school.

Select a wall or a counter cutter, according to the place where the paper is to be kept, and fasten it securely. A wall cutter costs about $4.50. The counter cutter, which screws to the shelf or the table, costs $3.75–$4.50. It can be purchased from the paper dealer (Millar's prices quoted).

(2) Brown or tan wrapping (kraft) paper for construction work, patterns, posters, and book covers, is very economical and attractive. It can be purchased by the roll (30 to 36 inches wide); also in sheets, if smaller amounts are needed. A heavy weight (basis 130 to 150 pounds) is used for some work. A medium weight (basis 50 to 60 pounds) is best for general use.

(3) An excellent bogus paper, No. 920, weighing 150 pounds to the ream from Millar is 5 cents a pound. Sheets are 40 × 48 folded, and are sold only by the ream.

(4) Other papers, by the ream in large sheets in brown and tan, heavy weight for book covers, construction work, or mounts, can be had at 8 to 10 cents a pound; weight 150–200 pounds to the ream.

(5) Large double sheets of wrapping paper and heavy butchers' paper, in Manila and brown, can also be bought by the sheet or by the pound from local stores, as needed. This is often the most economical way to purchase.

(6) Newspaper stock (unprinted) comes by the pound in any size, from the local newspaper. It tears easily and is thin, but it is cheap and usable for writing, drawing, and painting and is especially recommended for the large painting sheets used by primary children.

(7) Gray building paper is heavy and of good texture, and comes in large sheets which may be had at low cost from mail-order houses, building-supply dealers, or as left-overs from a contractor. It is fine for poster mounts, for both art and construction work, and for book covers.

(*b*) Colored papers are more expensive.

(1) Wrapping paper in beautiful shades is also to be had.

(2) Cover papers come in exquisite grades and tones, and fancy paper for stationery, book facings, and other craft uses are available for special needs. Of course, these are expensive. *Direct Advertising*, a paper-trade magazine, which contains specimens of these papers and addresses of dealers in them, can usually be seen at the local printer's.

(3) The Japan Paper Company has especially lovely vellum and art papers, in vivid shades, for special work — such as art booklets and prints of Christmas cards — at 15 cents the sheet, size 16×24 inches. Others especially gay are the blue, yellow, purple, and red, Toyogami paper and the gold-flecked Hottagami paper ($13\frac{1}{2} \times 17\frac{3}{4}$ inches at 10 cents a sheet); Fabriano and Lombardio paper also cost 10 cents a sheet.

(4) Small pads of cheap colored paper often give soft, attractive colors.

(5) Printers (i.e., Press Company) frequently carry very cheap papers in good colors.

(6) Casing papers and paper for book covers, in beautiful texture and colors, can be purchased from Gaylord's and the Holliston Mills.

3. *School Papers*

These come from any school-supply house.

(*a*) Plain papers are of many grades. The prices fluctuate greatly.

(1) The least expensive is the practice, or arithmetic, paper (white), which can be cut in any size. It is heavy enough for

drawing, painting, and writing (no ink), also for mimeographing. Hammett carries a grade at $1.40 per 1000 sheets. This paper quickly turns yellow, and is only used for temporary work.

(2) A plain gray or Manila paper is also good. No. 20 from Milton Bradley (12 × 18 inches) is recommended.

(*b*) Colored papers especially for cutting are of several grades and sizes.

(1) Engine papers (thin), sizes 6 × 6 inches, 6 × 9 inches, are satisfactory, and inexpensive.

(2) Other papers are more expensive but have richer colors. Investigate.

4. *Cardboard; Pulpboard*

(*a*) Cardboard and pulpboard can be purchased from school-supply house, printer, or paper dealer. Most of the school supply of these two things should come from old boxes or tablet backs.

b. Quantity; Cost

Paper may take a large part of the school-supply money or it may cost practically nothing. There are many ways of economizing — for example, by the use of free material, the substitution of cheap for high-priced papers, and the buying of the less expensive type of art paper.

A great deal of paper is needed, so it is well to have a generous supply on hand. This will include all possible weights, grades, sizes, and colors of both paper and cardboard. Exact amounts are not suggested, since much depends upon the use. For a group of forty children the following amounts are suggested for a year's supply:

1. *Liberal Supply*

1 Roll of Manila wrapping paper (with cutter), 30 × 36 inches.
1 Roll of brown wrapping paper (with cutter), 30 × 36 inches.
1 to 2 reams bogus paper, 12 × 18 or 9 × 12 inches.
2 to 4 reams news print, 18 × 24 or 24 × 36 inches.
2 to 4 packages assorted colored papers, 9 × 12 inches or 6 × 9 inches.

Supplementary free papers.
Special colored papers as needed.

Or

2 to 4 reams Manila paper No. 20, 12 × 18 inches or 18 × 24 inches.
1 ream heavy brown wrapping paper, folded sheets, 24 × 46 inches.
1 ream bogus paper, 18 × 24.
2 to 4 packages colored paper, 6 × 9 or 9 × 12.
2 to 4 reams news print, 12 × 18, or 18 × 24, or 24 × 36.
Supplementary free papers.
Special papers as needed.

2. *Minimum Supply*

1 roll of Manila wrapping paper, 30 or 36 inches wide, or
2 reams Manila paper, No. 20, 12 × 18 or 18 × 24.
1 ream heavy brown wrapping paper, 24 × 36.
Supplementary free papers.

c. Suggestions

1. *To Order or to Collect Paper* (See p. 319)

(*a*) Select paper which can be used for many kinds of work, in general unglazed, medium weight, Manila or soft light gray.

(*b*) Save all clean smooth paper and all bright-colored paper when they come to hand. Trim and press it at once, and store it in a good place. Also keep all kodak, ribbon, and wall paper.

(*c*) Keep on hand a box of gay-colored paper (scraps and pieces) for cutting; also a fair-sized box containing scraps of tissue, crêpe, and other papers, and assorted odds and ends.

(*d*) Collect other free paper as it is needed, unless the school is isolated and supplies are hard to get; in that case a larger stock of everything should be kept.

2. *To Care for Paper*

Paper needs care; it quickly becomes soiled, mussed, faded, or dog-eared. The following plan is worth trying:

(*a*) If a large supply of paper is on hand, separate it into packages about three-fourths inch thick; wrap and label the packages and stack them in boxes out of the way.

(*b*) Sort colors, sizes, and weights, and label each plainly.

(*c*) Keep a small stock of paper in an open box for present use. Replace as needed; see that this is always attended to.

(*d*) Never pull a piece of paper from the middle of the stack, but lift the upper pile, then replace it evenly.

(*e*) Trim, press, and sort the free paper and cardboard as it comes. Do not pile it up folded or in a mussed condition. Take as good care of the free material as of that purchased.

3. *To Dye Paper*

All kinds of paper can be dyed beautiful shades. Brown and Manila wrapping paper of any weight, the paper of cheap writing pads or of tablets, bogus, gray, and Manila drawing paper, and dark brown and gray papers give especially good results. Browns and grays take only dark, rich colors.

(*a*) Mix the dyes as for cloth. A strong solution is needed for quick work and good colors.

(*b*) Use a flat shallow pan. A baking pan will serve.

(*c*) Lay your paper in the bath (if even dyeing is desired, taking care that it is flat and entirely covered) and leave it for a short time.

(*d*) Remove the damp paper and place it between a cloth or blotting paper or some other clean paper, and press it with a warm iron or put it under an even weight until it is dry. Or you can put paper clips on the corners of the paper and suspend it by the clips from the edge of the table till it dries. The weight of the paper prevents the edges from curling.

(*e*) Vivid effects can be obtained by dipping paper into one color and then while it is still wet, into another; by dyeing paper half one color, half another; by twisting or crumpling papers, then dipping them, and afterward pressing them. Older children like to try these plans.

4. *To Modify Paper*

(*a*) Transparent paper can be made for window pictures, peep shows, and other art work. On one side of a sheet of colored tissue brush quickly a coat of oil (cottonseed or a like oil), and shellac the other side.

(*b*) Parchment paper can be made by oiling heavy brown wrapping paper and then shellacking both sides.

5. *To Make Paper*

Older children can make paper for their prints and Christmas cards; see Bonser and Mossman: *Industrial Arts for Elementary Schools.*

6. *To Make Paper Pulp*

Paper pulp is used for relief work and representative set-ups, and for other school purposes.

(*a*) Tear old newspapers or cardboard into small single pieces and cover the pieces with boiling water. Let them soak for a day or two, and then draw off the water and pound or work the material with a stick, or rub it on a washboard with a stiff brush, until a mass of small pulp is made.

(*b*) A fine pulp can be made by soaking used paper towels and napkins and then working the mass till it is fine and smooth.

7. *To Make Papier-Mâché*

Papier-mâché is used for making permanent models. For sand table or other representations any shape can be made by spreading the pulp over a foundation of fine wire that is supported from beneath.

The following recipe is given by the Industrial Arts Coöperative Service:

(*a*) Preparation of the pulp: Use deadening felt paper such as builders use. Pieces can often be obtained when a house is being built. Old pieces of cardboard can also be used. Tear the dry felt into small pieces, place the pieces in a pan, and heat them on a stove. As they dissolve, work the mass with the fingers until there are no lumps. Squeeze it dry with the fingers. Keep it until it is needed.

(*b*) Preparation of the glue: Take one cupful of dry, ground fish glue and one cupful of water. Heat the mixture in a double boiler until the fish glue melts.

(*c*) To make the papier-mâché: Put into a pan one cupful of dry pulp; one-half cupful of water; one cupful of liquid glue; one-third cupful boiled linseed oil to give pliability. Mix thoroughly, and add whiting or pulverized gypsum for strength. Keep mixing until three cupfuls of whiting have been mixed. This is the moist papier-mâché.

Note — Keep a dry cloth over the pan when it is not in use. If the pulp hardens, heat the pan over hot water to melt the glue. If necessary add a little water.

PASTE; GLUE; WORK AIDS

a. Kinds; Sources; Prices

Paste can be bought or made. Glue can be bought in dry or in liquid form.

1. *School-Made Paste*

School-made paste serves most purposes, and is the most economical kind. It will not keep very long, however, so make it in small quantities. The children bring the flour from home. About 25 cents for alum and 5 cents for oil of cloves from the drug store will serve for about 5 quarts of paste.

(*a*) White paste recipe. (1 quart) 2 cupfuls of flour, 2 cupfuls of water, 1 tablespoonful of powdered alum. Mix till smooth, then add three-fourths cupful of boiling water, and cook the mixture in a double boiler till it is fairly thick, stirring it constantly. Then add a few drops of carbolic acid or of oil of cloves and strain into small jars. Keep the paste well covered.

(*b*) A very delicate transparent paste is made by soaking a certain amount of gum tragacanth for several hours in a little water, till it jellies. The material can be purchased at any drug store.

2. *Ready-Made Paste*

Ready-made paste of excellent grade can be purchased.

(*a*) The following prepared pastes are recommended.

(1) Adhezo (Milton Bradley) is a good white paste.

(2) Stixit (Prang) is a mixture of glue and paste with strong sticking qualities.

(3) Gaylo (Gaylord) is a strong concentrated paste for strong material and can be thinned for ordinary use to twice its bulk.

(4) Cico (Carter's) is a thin paste which dries quickly, does not run or spot very much, and is exceedingly good for delicate work.

(*b*) Paste powder is economical. Wall-paper paste can be had in powder form at only a few cents a pound from any paint store.

Prepare by adding hot water and stirring till the mixture is smooth. Make only a small quantity, since it sours quickly.

3. *Glue*

Glue, liquid, or flakes (Carter or LePage) from a hardware or a paint store, is needed.

(*a*) Liquid glue is the easiest and best to use when small amounts of glue are needed.

(*b*) Glue flakes are more economical and best when large quantities are needed; also for sizing calcimine.

(*c*) China cement mends broken vases, pottery, and costs 10 cents a tube at any book or drug store.

b. QUANTITY

A good plan for the average school is to purchase a small amount of paste for special work and to make what is needed for general use.

1. *Liberal Supply*

	Cents			Cents
½ pint jar "Stixit"	.30	1 tube of China Cement		.10
½ pint can Liquid Glue	.30	1 tube of Cico		.10
1 tube of wall-paper paste	.05	Home-made paste or Wall-paper paste	about	.30

2. *Minimum Supply*

½ pint can Liquid Glue	.30	Home-made paste or Wall-paper paste	about	30

c. SUGGESTIONS

1. *To Keep*

(*a*) Always keep paste and glue well covered. This is important.

(*b*) Keep a quantity of spreaders, holders, and cleaners in a box near the paste for quick distribution.

2. *To Use*

(*a*) Spread newspapers under the work to be pasted, and so avoid paste marks and stickiness on desk or table.

(*b*) Each child needs a spreader (a narrow piece of cardboard or a paste stick), some paste on a piece of cardboard (the amount decided by the work), and some paste cloths or papers. Destroy this material after the work is done.

(*c*) Press (p. 278) all pasted flat work, or it will curl and warp. Be sure that all paste is off the surface of the work, or the material will stick together.

PLASTER OF PARIS

Plaster of paris is a fine white powder which hardens in a short time after water is added. It is clean, easy to handle, and serves in many ways in school.

a. Uses

1. *For Practical Purposes*

(*a*) Clay and unfinished clay work are kept in proper condition on damp plaster of paris.

(*b*) It is excellent for patching holes in wood and plaster walls. When dry and scraped smooth, it can be painted or calcimined to match a wall.

(*c*) Plaster of paris mixed with white of egg to the consistency of thin cream, makes a good cement for china.

2. *For Art and Construction Work*

(*a*) It may be used in illustration work on a board or a table in several ways and is especially good when the model or "set-up" is more or less permanent.

(1) Spread it on the table as a basis and when it is dry color it green or brown, as desired, or leave it white to give a sand or snow effect.

(2) Spread it over models of igloos and houses, to make an Eskimo scene.

(3) Make models of houses by pouring it into molds of clay or tin, or into boxes, as in cement work. Color it when it is dry.

(4) Spread it on the outline of maps drawn on table or on paper, and work it into proper shape before it dries. Color it when

dry with water color or with calcimine or oil paint, to make relief maps.

(*b*) Beautiful mass carvings are made from blocks of plaster of paris by the children in Professor Cizek's Art Classes in Austria. This would be an interesting experiment for our sixth- and seventh-grade children. The plaster should not be quite hard when carved; slow-setting plaster is best.

(*c*) The most common use of plaster of paris in schools is for molds and casts from cement and clay models (see Bonser and Mossman, *Industrial Arts for Elementary Schools;* Sargent, *Clay Modelling in Public Schools;* or Lemos, *Color Cement Handicraft*). Slow-setting or medium-setting plaster is best for a beginner.

b. Kinds; Sources; Prices

There are several kinds of plaster of paris — slow-, medium- and quick-setting. It is best when purchasing to state the purpose for which the plaster is to be used, and have the dealer's advice. The cost is about 5 cents a pound from a local paint store or a mail-order house.

c. Suggestions

1. *To Keep*

Keep in covered glass jars.

2. *To Mix*

Place the powder in a clean pan (this must be washed or scraped out at once after use). Add a little water at a time, stirring rapidly till a smooth mixture, which will pour slowly, is obtained. Care must be taken not to use too much water, or the plaster will not harden. Try out proportions before using. Some work requires a thicker mixture than others.

3. *To Use*

(*a*) Use at once. Pour or spread over surface or into molds.

(*b*) Model or shape as desired before the preparation becomes hard — as for relief work, plowed fields, or a stone wall. When a smooth surface is desired, do not touch it until dry.

(*c*) Allow the plaster to dry thoroughly; paint or color it as desired.

RELIEF WORK MATERIAL

This is often needed for costumes, stage properties, and craftwork. It may be made or purchased, goes on any material, such as cloth, metal, or wood, and when dried can be colored as desired by painting or gilding.

1. "Gesso" comes in tubes and jars (25 cents to $2) and is a good composition. (Hammett.)

2. A mixture of equal parts of whiting and glue (heated), used at once, hardens quickly and is excellent for relief work; this preparation also mends pottery and fills holes and cracks in walls.

3. For relief maps or other work, boil used paper towels or else soak them for some time. Drain the water through a cloth and work the material with a stick till it is fine. Add 1 tablespoonful of flour for each handful of pulp. Cook thoroughly.

SANDPAPER

(See also Blue Print Paper; Linoleum; Wood)

a. Uses; Sources; Cost

Sandpaper from the ten cent stores, at five or ten cents a package is used, not only for carpentry work but for making prints, and several packages, fine and coarse, should be kept in stock.

These prints, which are simple and attractive, are used as invitations, place cards, Christmas cards, valentines, programs, book covers, and other decorations.

b. Suggestions

1. *Wax Crayon Print*

(*a*) Use coarse sandpaper. Cut it to the required size and sketch on it the picture or the design which is to be printed.

(*b*) Fill in this outline with a cheap grade of wax crayon from the ten cent store. Only cheap crayon will do, since it must be waxy to stick. Rub the crayon on hard, so as to make a smooth surface. Also scrape other parts of the picture surface with a knife, to shade.

(*c*) Ink well with printers' ink, and print on bright colored paper. (See Linoleum, p. 85.)

(*d*) If the print is not clear, rub in more crayon, ink more

freely, or give stronger, more even pressure — perhaps all three. Practice is required.

2. *Applied Sandpaper Print*

Another print is made by using two grades (fine and coarse) of sandpaper. Cut the picture or design to be printed of one grade and paste this on other, which forms the background. These are printed as above.

SAWDUST

Sawdust is light and clean, it is easy to handle and usually easy to obtain. It can be colored in various ways and reused as often as needed. Both fine and coarse quality are good — the fine packs better.

a. Uses

1. *For Free Play*

Little children may use it on the floor for all kinds of play, a sort of miniature sand pile.

2. *For Illustrative Work*

(*a*) Sawdust is really better than sand for the so-called sand-table work, for it may be used on any table, desk, or board. Since it can be colored, it offers such attractive and realistic effects as green grass, brown earth, gay colored flower borders and beds, all of which add interest to the work.

(*b*) Older children make temporary outline and relief maps of varied colors.

3. *For Practical Work*

Sawdust is excellent for stuffing cloth animals and pincushions, and for filling bean bags.

b. Sources; Cost

Sawdust is obtained — usually free of cost — at sawmill, planing mill, furniture factory, carpenter shop, or wherever a new house is being built.

c. Quantity

A 2-peck measure full will go a long way, though more will be needed for floor play with little children.

d. Suggestions

1. *To Color*

(*a*) Strong colors in calcimine, dry color, or dye powder are used.

(*b*) Place sawdust in a box, sprinkle it with powder of the color desired, add hot water or cold water, as needed, for moistening, and stir the mixture till the sawdust is well colored. This can be used over and over if desired.

(*c*) Try out a small amount first to be sure the color is deep enough, since it fades as the sawdust dries.

(*d*) Mix at one time all that is needed for a piece of work. It is hard to reproduce the color exactly.

2. *To Use*

(*a*) For miniature scenes for "set-ups," first mark off plots and fasten all objects such as houses, trees, fences, to the board or the table, since the sawdust will be too light to hold them in place. Then spread the colored sawdust on smoothly till it is about half an inch thick.

(*b*) For relief maps, use fine sawdust and model as in sand work.

(*c*) For floor play, spread newspapers, and give plentiful amounts of sawdust to each child.

3. *To Keep*

Place in cloth bags or boxes; keep the colors separate.

SHELLAC

Shellac is a dryer and finisher for wood and gives a gloss finish like enamel, though it does not wear so long. It also stiffens and toughens paper, giving it a waterproof surface. It is excellent for school use, since it dries rapidly, is easy to handle, and does not cost much. Special shellac brushes, also, are needed.

a. Uses

It is used on all kinds of construction work, in wood or paper —

furniture, toys, puzzles, boxes, cut-out dolls and animals — and is also used on pictures, to preserve them.

b. KIND; SOURCE; PRICE

Shellac comes in white and orange color and can be bought at any drug or paint store, at about 50 cents to 75 cents per pint.

Orange shellac can be used on ordinary work, but not on pictures or fine work, since it changes the color and is not very transparent.

Thin white shellac is used on pictures; have them flat when the shellac is being applied.

c. QUANTITY

1 pint orange shellac.
½ pint white shellac.
1 pint alcohol (denatured) for thinning and cleaning.
4 brushes (1 of 2-inch size, 3 of small round kind), to be used with shellac only

d. SUGGESTIONS

1. *To Keep*

(*a*) Keep the shellac tightly corked; this is most important.

(*b*) Have several small jars or large-mouthed bottles, and fill them for daily use from larger containers.

2. *To Use*

(*a*) Always thin the shellac with alcohol before using it.

(*b*) Two or three thin coats give best results; they can all go on in a short time.

(*c*) Dry shellacked work on wax papers spread over corrugated paper.

(*d*) Clean brushes with alcohol.

SOAP

(See also Wood)

a. USES; SOURCES

Ivory or other white soap offers a satisfactory material for the carving work of older children. Working with it is a good preparation for carving in wood. Figures of all kinds — people, build-

ings, animals, and carved pictures — in high or low relief, are easily made in this way, and are very attractive and keep well for quite a while.

Use an ordinary paring knife, or any other kind at hand or a one-edge safety razor blade. Children bring soap from home, either large or small cakes.

b. Suggestions

1. *To Use*

(*a*) Have the plan very clearly in mind and make a drawing before the carving begins.

(*b*) If the work is in relief, sketch the outline on the bar of soap.

(*c*) Be careful to avoid deep cuts; carve gradually.

(*d*) Save all chips to make soap jelly for school use or bath bags for Christmas gifts, and use the finished work for the same after it has lost its beauty.

WATER-COLOR PAINT

(See also Calcimine; Dye)

a. Uses; Kinds; Sources; Prices

1. *Opaque Water Colors* (Tempora Colors, or Show Card Colors)

This kind of paint has replaced almost entirely for art work in schools the transparent water colors in boxes. In beautiful colors, and in gold, silver, and black it gives artistic results. This material is expensive, but the colors are deep and rich and do not rub off; if it can be had it is preferable to any substitute — in the upper grades, especially. Even if it is not used for regular work, a few jars for illustration work, touching up things, poster-making, are desirable.

(*a*) A minimum set of colors consists of white, black, brown, vermilion red, chrome yellow, chrome or emerald green, and ultramarine blue. To these may be added, if possible, gray, violet, olive green, and medium blue.

(*b*) About four sets should serve the average group. The small, 2-ounce jars are commonly used, but as a rule it is best to purchase the paint in quart jars and pour it into small screw-top jars as needed. Keep it covered; the paint dries out quickly.

(c) These colors are made by a number of firms and carried by all school-supply houses. It seems best to order direct from Devoe & Reynolds, who give 25 per cent discount to schools, or the Prang Company, 20 per cent discount from regular prices (2 ounces at 25 cents, one-half pint 65 cents, 1 pint $1.10, 1 quart $2). Large pieces of paper (p. 95) and big brushes (p. 120) are needed.

2. *Peerless Japanese Transparent Water Colors*

For very delicate work by older children, such as making letters or coloring pictures, these are good. They come in small books, the paint being on strips of paper, and are applied with a special hand brush. The brush must be wet first and then rubbed on a color strip; or a small amount of water is put into a glass and colored by rubbing the brush on a strip and dropping it into water till the right shade is produced.

A small sample book costs 45 cents (this is usually sufficient), a larger one, $1.50, from any Japanese dealer.

3. *Substitutes*

(*a*) Free substitutes

Dye, bluing, berry juice, walnut juice, in very strong preparations, are sometimes used where there is no money for supplies.

(*b*) Inexpensive substitutes

(1) Calcimine or Fresco Paint has already been discussed (pp. 66, 67).

(2) Lane's Liquid Color, a strong dye in vivid colors, lacks the richness and texture of the Show Card Colors, which sink into the paper instead of covering it, but the colors are good and the entire set of ten costs only $1.50 (Hammett). This is supposed to supply a group of thirty children for a year. Two sets would be better.

WOOD

(See also Tools; Paint; Shellac; Nails)

Children should do woodwork in every grade in the elementary school. This work is especially desirable because it brings into use the large muscles and also because it gives

strong, permanent results which help to balance the more perishable kind of work. A separate shop fully equipped and a special teacher are not needed for this.

Wood is simply another material through which the children work out ideas and satisfy needs. They use it just as they use paper, paint, or clay, because it best serves the purpose in hand.

a. Uses

1. *For Practical Work*

(*a*) Such real things as school equipment, wagons, molds for cement, bird houses, homes for pets, and crude furniture.

(*b*) For mending, patching, and other practical jobs.

(*c*) For carving and whittling (older children only).

2. *For Construction Work*

(*a*) For toys, doll houses, boats, and miniature furniture.

(*b*) For models of various kinds.

b. Kinds; Sources; Sizes; Prices

1. *Kinds; Use*

The kind of wood needed depends upon the work. In general, for children's work, the wood must be soft and without many knots. Smooth poplar, cypress, and white pine are best. Spruce, yellow pine, and oak are too hard.

(*a*) A soft, thin wood without knots (linden or bass — the stock used in furniture drawers) is best for scroll-saw work.

(*b*) Wood for carving or gouging should be soft and perfect; one to two inches thick for boats and toys, three to five inches for bowls, trains, etc.

(*c*) Thick pieces of bark and of soft white pine are good. Saplings, and chips from woods and from woodpile, supply some needs.

(*d*) For real work, such as shelves, and equipment of all kinds, lumber must be purchased. Expert advice should be obtained.

(*e*) Dowels are frequently needed for wheels, posts, and other work.

(*f*) Wooden odds and ends are often usable. Broomsticks, spokes from chairs or banisters, and heavy wooden curtain poles make posts, columns, and tent supports, and may be sawed into wheels or building pieces for little children. Button molds and spools also make wheels or serve as parts of furniture in playhouses. Meat skewers are good mounts for windmills, flags, seed markers and other things.

2. *Sizes*

If wood is purchased for construction work, the following sizes for general use are suggested. Pieces about five feet long are ordered, but for small children, these should be sawed into short lengths for making wagons, boats, and toy furniture.

The amount ordered depends upon the group and upon the frequency with which the material will be used.

Planks $1'' \times 10''$ and $2'' \times 8''$
Planks $\frac{1}{2}'' \times 4''$
Timber $2'' \times 2''$
Strips $1'' \times 1''$
Window strips $\frac{1}{2}''$ thick
Lattice strips
Flat picture molding for frames
Dowels in two sizes, $1\frac{1}{2}''$ and $3''$

3. *Sources; Prices*

Wood supply should come from a local source if possible. Investigate the local supply (shops, mills, lumber dealers' stock, different kinds of native woods), prices, and also the nearest outside supply. Sweet's catalogue gives addresses of mills and plants.

(*a*) Bass wood or white wood for knife work comes from school-supply houses in pieces $9 \times 4 \times \frac{3}{4}$; $\frac{1}{8}$ inch; $\frac{1}{4}$ inch; at price of $3.50 to $5 per 100 pieces, also from a furniture factory.

(*b*) Dowels come from Prang and from Hammett, and from manual training and hardware firms. They are very cheap.

(*c*) Boxes (p. 64) have been fully discussed. They supply some of the required wood.

(*d*) Pieces of wood left over from building are often to be had for a small amount or for nothing. A load or a barrelful of short

pieces from a local mill or shop is inexpensive; it will give excellent results, for the different shapes of the pieces often suggests things to make.

c. Suggestions

1. *To Use*

(*a*) Ask aid from a manual training teacher, a carpenter, or some one else who knows, when real work is attempted and the matter is in doubt. Occasionally Saturdays or out-of-school hours must be used for getting this help.

(*b*) In most of the work have the children try things out, as in other constructive work.

(*c*) Have the children work as individuals or in very small groups; when tools are limited see that "turn about" is observed.

(*d*) Work out-of-doors whenever possible and thereby avoid noise and muss.

(*e*) For painting and finishing, see Paint (p. 90), Shellac (p. 110). For toys and other small work with clean new wood, water color or dye may be used instead of commercial paint. Give three coats of shellac as a finish.

(*f*) For other materials for woodwork or carving see Tools (pp. 120, 124); Glue (p. 105); Sandpaper (p. 108); Nails (p. 83).

2. *To Keep*

Store in a large box, fixed or rolling (pp. 333, 334).

B. TOOLS AND PRACTICAL APPLIANCES

Tools and appliances must be selected with care. No school needs everything here suggested; each teacher, of course, decides what is suited to the special work conditions. It is seldom necessary to buy for each child a full set of any equipment. Most work can be so adjusted that only a few children at a time work in the same medium; hence, a few carving tools, carpenters' tools, and paint brushes will suffice. The following are discussed.

Appliances and Devices
Brushes
Carpenters' Tools and Equipment
Carving Tools: Knives
Rulers
Scissors

I. APPLIANCES AND DEVICES

The following appliances are desirable for Constructive Activities:

a. Desk Boards (p. 278)

b. Boards for Pressing (p. 278)

c. Boards for Illustrative Work

Boards for holding models or set-ups, are needed for the upper grades. They take the place of a sand table and are easy to move from one room to another and to store when not in use. These are made of white pine or poplar; or old lap boards, wooden trunk trays, or boxes may be used. The boards should be narrow enough to pass through a door without tipping and as long as desired; three and one half to four feet is convenient. A rim at least two inches high on three sides and four or five inches on the fourth side—this last to form a support for a background—keeps the work in place.

d. Drawing Boards

Drawing boards may be of wood or of composition wall board (p. 77). A bread board is excellent for this purpose. Desk boards (p. 278) also serve. If wall board is used keep it in flat piles, when not in use, to prevent its warping.

e. Easel

A steady, well-constructed easel with a securely attached drawing board (at least 22″ × 28″ or larger) is best to use in painting and drawing on large sheets of paper, and is also used to hold reading charts, and on the stage for illustrative purposes. Two or three easels are desirable for each primary room, and perhaps two for general use by upper grades. They can be purchased from Milton Bradley or some other school-supply firm at about $7.50, or made locally (at the school or by a carpenter) at a low cost. The top of

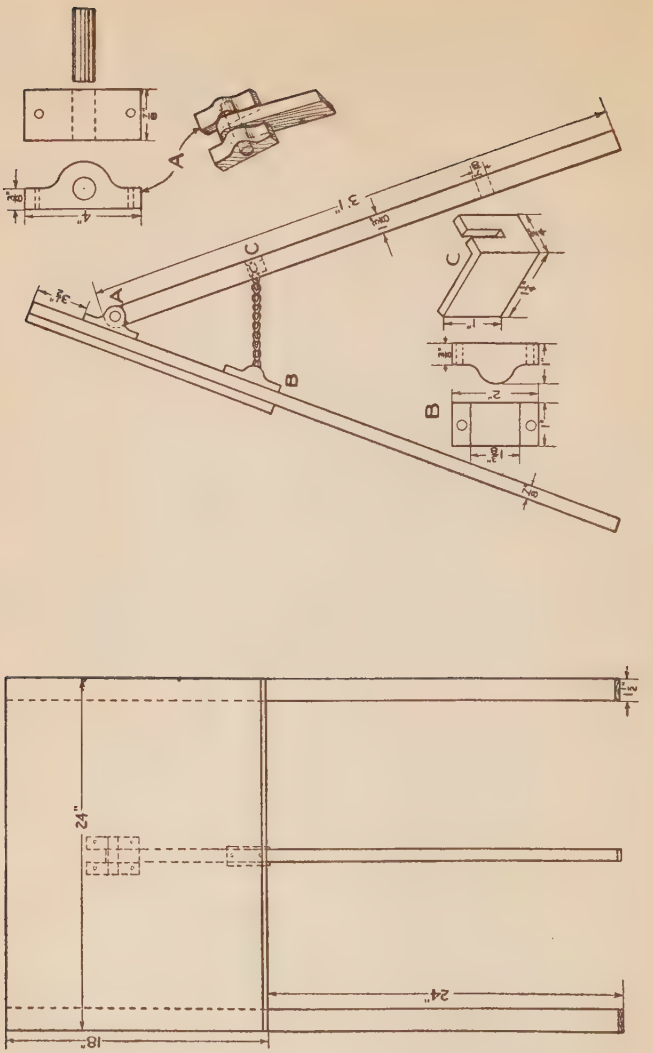


FIG. 2. WORKING DRAWING OF EASEL

For drawing, painting, bulletin boards, and other purposes. Designed and used in Passaic, New Jersey, Public Schools
(Courtesy of Passaic, New Jersey, Vocational School)

the paper should be about level with the eyes of the standing child. A long, narrow box for holding crayons or paint, fastened below the board, is helpful — or a small table may be used instead. A bread board with legs and a back attached by hinges may be used.

f. Flashlight (p. 280)

g. Hand Axe (p. 281)

h. Knife (Jack) (p. 124)

i. Paper Cutter (p. 274)

j. Punch (p. 276)

k. Printing Outfits (p. 275)

l. Roller (Hand) for Printing

A small hand roller with a handle in 5-inch (90 cents) and 10-inch ($1.50) sizes, for inking prints, comes from the Kelsey Press. Clean the roller with gasoline or benzine as soon as the work is done. Be perfectly sure that all the ink is removed.

A smooth glazed tile, a piece of thick glass or crockery, or some other hard surface is needed for ink surface.

m. Sewing Machine

1. *Large Machine*

A real sewing machine (pedal or hand) is a convenience, as it is needed for costume making (p. 189), Christmas or industrial art work, and for practical work on aprons, curtains, bags, and so on. This machine need not be fine or new. Often an old one, either given or purchased at a low price, will do quite well, since very little of the work requires particular stitching.

2. *Toy Machine*

A toy hand-sewing machine from the Singer Co. and from toy stores is also well worth having in each room. It is a great help in making doll's clothes and furnishing doll houses.

n. Trays (p. 38)

II. BRUSHES

a. KINDS; SOURCES; PRICES; QUANTITY

1. *Brushes for Art Work*

One brush for each child, or a minimum of one for every four children is advised.

(*a*) Largest size wash brushes from Milton Bradley or the Prang Company, at 20 cents each, or from the ten cent store at 10 cents each, are needed for the primary children.

(*b*) For the older children these large brushes and also small ones for finer work are desired.

2. *Brushes for Other Work*

Brushes for shellac, oil paint, and other uses are discussed with the materials.

b. SUGGESTIONS

1. *To Care for:*

(*a*) All brushes should be washed after they are used and dried before being put away. — Never leave them in water, calcimine, or other liquid.

III. CARPENTERS' TOOLS AND EQUIPMENT

(See also Wood)

Certain carpenters' tools and other equipment for work in wood are essential in every room, whether the school has a shop or not.

a. USES

This equipment is needed for all kinds of practical tasks and for working out many of the children's interests and plans.

b. KINDS; SOURCES; PRICES; QUANTITY

1. *Tools*

(*a*) Tools should be of regulation size, strong in construction, and of the best quality. Cheap tools are dangerous, for they may break while being used and injure the children.

(*b*) Tools can be obtained:

(1) From any local hardware concern, from mail-order

houses, and from Hammacher Schlemmer and Buck Brothers. (Send for catalogue.)

(2) Sometimes old or broken tools will be given, and these, when cleaned, mended, and sharpened, are often as good as new ones.

(*c*) The number and kinds of tools depend upon conditions: those for older and those for younger children are practically the same. Lists follow presently. The following plan for selecting and purchasing tools is suggested:

(1) Start with a good crosscut saw and two strong hammers of good quality. Supplement these with four to six hammers, four chisels, and four scroll saws (which cut cardboard as well as thin wood) from the ten cent store.

(2) These may be followed as soon as possible with a brace and bits for boring holes, a keyhole saw, another crosscut saw and a hack saw, all of good quality.

(3) Later, if needed, smooth planes, a T-square, and other tools may be added, but it seems best to have more hammers and saws rather than many different kinds of tools, since it is very hard to keep up with a great variety. Furthermore, all the work is simple and involves very few operations.

(4) Each grade must have its own work tools. Experience has proved that in this matter neither coöperative ownership nor borrowing and lending is satisfactory. This does not apply to a shop, but to individual rooms.

(*d*) Keep the tools in plain sight and easy reach. A chest is not advised unless there is no other place equally secure. Inside of door of the cupboard or the closet will serve as a tool board. Hang the saws, and have strips of cloth nailed on the door into which to stick hammers, chisels, and other small tools. The tool board presently to be described is best.

(*e*) Take care of the tools; keep them well oiled, clean, and sharp.

2. *Work Bench*

A work bench or some substitute for it is needed. The bench should be approximately hip high (about twenty-four inches for first and second grades, twenty-seven inches for third grade, thirty inches for fourth grade, is the average height); and twenty by

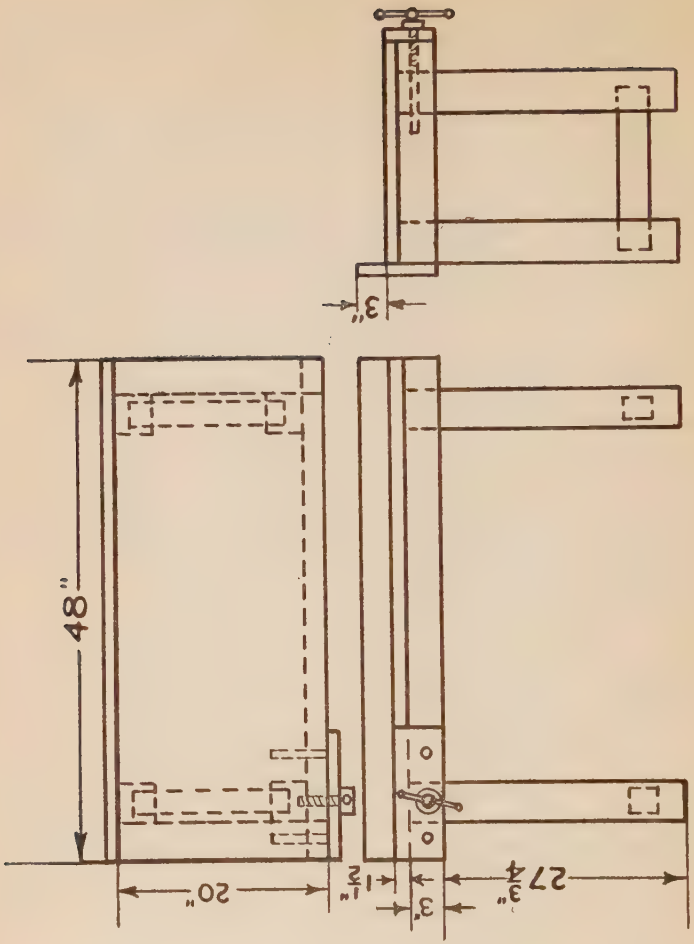


FIG. 3. WORKING DRAWING OF CARPENTER'S BENCH

Height determined by size of children

(Courtesy of the Manual Training Department, Oswego, New York, Normal School)

forty inches, top measurement. One bench for each fifteen children is desired. These benches may be purchased, or school-made, or a substitute may be used.

(*a*) A bench made by any carpenter or by older children will cost much less and serve equally well.

(*b*) A strong table with vises attached may be used.

(*c*) Another suggestion is one or two sawhorses (p. 297) with boards laid across and fastened on with C-clamps.

(*d*) Benches, ready-made, cost about $12 each from Burnam and Black, E. H. Sheldon & Co., Hammacher and Schlemmer, and other school-supply firms.

3. *Other Equipment.* (See lists in Section C, which follows.)

(*a*) Some device is necessary for holding boards while they are being cut. These devices come from the above sources; investigate prices.

(1) *Vises* are best for holding boards to be sawed; they are also used for holding glued things in place for straightening boards, and for small block printing. A stock vise, Sheldon, or Toles, is advised.

(2) *Clamps*, each with an 8-inch opening, will hold heavy boards; smaller ones, with 2- to 6-inch openings, are also good.

(*b*) A *miter box* (square or corner) is needed; this can be made instead of bought. Any carpenter will advise how to make one.

(*c*) A *sawing board*, or bench hook, is also needed to prevent injury to table. It can be made by children from a board eight to twelve inches wide and eighteen to twenty-four inches long, by boring a one-inch hole about two inches from the middle of one end and sawing a "v" shaped notch in the end to meet the hole. The board may either be clamped to the table or fitted with cleats in such a way that it slides onto the corner of the table. The sawing is done at the notch and hole, which should project two or three inches beyond the edge of the table.

(*d*) *A movable tool board* which hangs on the wall is a valuable aid. Hooks or wooden pegs hold the tools. An outline of each tool painted or drawn on the board shows the place of each and makes it easy to replace tools that have been used and to check up missing tools.

IV. CARVING TOOLS; KNIVES

Each child in the upper grades (4 to 6) finds many practical uses for a good knife, such as carving, whittling, and making block prints.

a. Kinds; Sources; Prices; Quantity

1. *Knives*

(*a*) A good pocketknife will supply most needs; one knife for each child.

(*b*) Paring knives from the ten cent store can be used for soap carving, plaster of paris carving, and certain woodwork. 2 to 6 will serve.

(*c*) Sloyd (Dexter) knives are desirable. From any art-supply house, at 25 cents to 50 cents. One for each child; or 2 to 12 for a group.

2. *Special Tools*

(*a*) "Dexter" stencil knives No. E are used for both stencil and block carving and cost about 35 cents each. 2 to 6 will serve.

(*b*) Special linoleum tools for making block prints, from art stores or school-supply houses, cost about $1.50 a set, and 25 cents each for single tools. One set, and from 2 to 6 small gougers additional, are desirable, though not necessary.

(*c*) Large hand gougers, three-fourths inch, for digging out additional boats and trays, are desirable. 2 to 6 are needed. They can be obtained at the hardware store.

3. *Substitutes*

A safety razor blade, with one sharp edge, makes an excellent carving tool for both wood and linoleum.

b. Suggestions

1. All knives must be kept sharp and clean.

2. Where possible have each child supply his own knife for general use. The school supplies special knives for work with stencils and linoleum.

V. RULERS

A ruler is essential for each child. It must have a level edge and lie flat on the work. The rulers for the first and second grades should be graded in one-half inches, those for the third grade in one-fourth inches, and for all other grades in one-eighth inches. They cost from any school-supply store from $2.50 a gross (144) upward.

VI. SCISSORS

a. Uses

These are greatly needed in every grade of the elementary school for practical uses, art-paper cutting, construction work, illustrative cutting.

b. Kinds; Sources; Quantities; Prices

1. *For Industrial Use*

(*a*) Scissors are easily lost, so a cheap quality is advised, especially for primary children. Some supply houses have a $5\frac{1}{2}$-inch size at $2.25 per dozen, and the ten cent stores have a larger size at 10 cents a pair; other houses ask $3.75 per dozen. (Investigate.) Sharp or semi-round points are best; round or blunt scissors are not advisable even for the smallest children.

(*b*) One pair for each child is desirable; one pair for every two children the minimum.

2. *For General Use*

Two or three pairs of larger scissors for cutting cloth, and some large, strong shears for cardboard or other heavy material, are most convenient. Flanagan has teachers', or editors', shears with long blades at 50 cents (nine inches).

c. Suggestions

1. It is sometimes possible to have the children furnish their own scissors, and this is a good plan, especially with older children.

2. Where there is no other way to get scissors, old pairs brought from home may be re-riveted and used; even broken points may be filed. Have rivet replaced in new scissors when they come out.

3. Keep the scissors in a box. Count them each time after use, for they are easily lost in work, and there is also a temptation to take them home.

C. SUGGESTED LISTS AND PLANS

I. GENERAL SUPPLIES

a. Stock Supplies

Minimum supplies kept on hand for construction work are best. These will include the following:

First, material used constantly — paper, paste, clay, cardboard, calcimine or fresco.

Second, material which must be ordered from a distance, and so requires time and the expense of postage.

Third, material that is very difficult to obtain, of a kind which will surely be used again.

Fourth, material that is not used often but is small in bulk and easy to keep — as glue and shellac.

b. Special Materials

Material used for a special project should be collected at the time needed, and the left-overs quickly thrown away or else given to the children for home work.

II. FIRST EQUIPMENT

The first equipment for this work may come within $25 if free material is used wherever possible: $10 will make a start. The following selection, in the order given, seems best:

First need:

Crayons	Paste	Rulers
Paper	Scissors	Odds and ends

Second need:

Calcimine or dye for painting	Shellac
Brushes	Sand
Clay	Sawdust

Third need:

A few carpenters' tools
Pieces of wood — nails
Needles, thread and cloth

Fourth need:

Special materials
Conveniences for work
Additional quantities of the above materials

III. INDIVIDUAL CONSTRUCTIVE EQUIPMENT

Where the children come from well-to-do homes, it is often possible to have them furnish their own materials. These are kept in locker or desk. The following lists are suggested.

Grades I–III:

1 pair scissors 5 inches long
1 large paint brush, round
1 pencil — large for 1st and 2d grades
1 tube each, library paste and glue
Tempora (show card) water colors or calcimine
1 work apron with long sleeves
1 rug or mat about 12 inches long
1 ruler; ½-inch marking for 1st and 2d grades; ¼-inch for 3d grade
1 sewing outfit
1 package of Manila paper 12 × 18
1 package of colored paper 6 × 9
1 set wax crayons, large, 8 colors
4–6 snapper clothespins marked with name of child
1 bread board (for handwork)
Materials for individual projects as needed

Grades IV–VI:

1 pair scissors, good blades
1 knife for whittling and carving (sloyd or pocket)
2 paint brushes, largest size, small size
1 sewing outfit
1 package Manila paper 12 × 18
1 set crayons, charcoal, chalk
¼-pint bottle shellac
1 work apron with long sleeves
1 ruler, metal edge
1 drawing pencil
3 linoleum tools
1 set tempora (show card) colors or of Miss Lane's colors
1 package colored paper 9 × 12 inches
1 tube each paste and glue
1 drawing board and thumb tacks
Materials for special projects as needed — for example, wood, linoleum, cloth

IV. GROUP CONSTRUCTIVE EQUIPMENT

The following stock supplies for constructive activities to be owned by the grade (30 to 40 children) are suggested, with approximate prices for a year's supply:

Paste, glue, mucilage, cement	$.80–$1.50	Paper, cardboard (purchased and free)	$2.00–$4.00
Crayons, chalk, charcoal	2.00	Calcimine or show card color or Lane colors	1.50–10.00
Gummed tape	.50– .65	Shellac — orange and white	.35– .60
Assorted nails, tacks, etc.	.25– .75	24 rulers	1.50– 3.00
1½ dozen brushes	1.80– 3.60	Sewing outfit	1.00
1 dozen scissors	3.00– 6.00	1 doz. sloyd knives (Grades IV–VI)	3.00
Carpenters' tools	10.00–20.00	1 paper cutter	10.00–18.00
1 set linoleum tools	1.50– 3.00		
Special materials as required			
1 punch	.50–10.00		

The following free material should be on hand if there is room:

Box of paper scraps
Box of assorted wood scraps
Box of linoleum scraps
Bag of sawdust
Bag of excelsior
Box of cloth scraps
Box of odds and ends
Several dozen assorted spools
Bag of small pebbles and shells
Newspapers

V. OUTFITS AND SETS OF MATERIALS AND EQUIPMENT

a. Weaving Outfits

Outfits for weaving, including looms and materials, are fully covered in Bonser and Mossman: *Industrial Arts for Elementary Schools.*

Special weaving materials such as jute and warp, and all types of looms, listed in school-supply catalogues. Hammett has an extensive stock.

b. Sewing Outfits

1. *Materials and Small Articles*

(*a*) Grades I–III. The sewing materials for the above grades are kept in a large box and used by the children as needed. No fine work is done, only long running, blanket, cross and darning stitches being used. Bags, mats, costumes, and dressing dolls and figures call for most of the sewing in this period.

1 paper of pins
2 spools white cotton 26–30
2 spools black cotton 26–30
Odds and ends of colored wool
1 pair cutting shears
2 large emery bags
2 papers crewel needles size 3–5
4 balls silkateen — red, blue brown, gray
Odds and ends of colored cotton
6 tape measures
1 cushion

(*b*) Grades IV–VI. Children in these grades own their outfit, which is kept in bag, box, desk, or locker. The usual small articles — needles, thimble, scissors, emery — are needed.

2. *Sewing Machines* (large; toy)

c. Cooking Outfit

The following equipment is needed for cooking when the work is done in the classroom. One such outfit will serve the primary grades: one, the upper grades.

Materials are purchased when needed or brought in by the children. Paper dishes may be used or a set of inexpensive ones of good color purchased.

1 stove (p. 283)
1 oven (small) (p. 283)
2 double boilers (p. 284)
2 saucepans (1 quart and 3 quarts)
2 baking pans
1 set of liquid measures (p. 31)
1 colander
2 mixing bowls (large, small)
1 sifter (small)
1 rolling pin
1 set measuring spoons
6 tablespoons
1 wooden spoon
1 egg beater (small)
1 set of cooky cutters (animal shapes)

d. Carpentry Outfit

The following lists have been compiled from those used in various progressive schools.

1. *Minimum Equipment for Classroom*

2 claw hammers (flat head, 12-ounce)
4 tack hammers
2 crosscut saws (9 points to one inch, 16–18 inches long, for younger children; 10 points to one inch, 18–22 inches long, for older children)
1 keyhole saw
1 brace with bits ($\frac{1}{4}$ to 1 inch) or 1 gimlet No. 18
2 vises or 2 C-clamps (8-inch opening)

1 table or 1 work bench, or 2 sawhorses
1 miter box

2. *Liberal Equipment for Classroom*

6 crosscut saws (as above)
2 ripsaws (24 inch)
6 hammers (as above)
1 smooth plane (No. 3)
10-inch try-square
1 brace with bits ($\frac{1}{4}$ to 1 inch)
1 screw driver
6 coping saws
2 chisels ($\frac{1}{4}$ and 1 inch)
2 miter boxes
2 benches (each 2 vises) or 1 table (4 vises)
2 C-clamps (8-inch opening)
2 keyhole saws

e. Stick Printing Sets

These small wooden blocks in various shapes with ink pads in several colors are carried by all school-supply houses and toy shops, and cost very little. Some have designs — squares, circles, triangles. Others (for small children) come with animals or figures, at about 75 cents up. Still other sets have letters, and may be used for printing work. The Northwestern School Supply Company carries these sets.

The children use stick printing sets for all sorts of designs and for decorating toy furniture and book covers. They are helpful in overcrowded rooms; buy in bulk when they are needed in considerable quantities.

f. Japanese Stencil Set

Japanese stencils from any Oriental dealer, of birds, flowers, trees, and landscapes are very interesting and may be used by the older children in some of their illustrating and in decorative work, and by the teachers for decorative panels and in other work.

g. Stencil Letters

Art Stencils for Boys and Girls, Alphabet No. 18, from Samuel Gabriel Sons, are used for posters, alphabet books, and so forth.

VI. PRINTED RECIPES AND DIRECTIONS

a. From the Industrial Arts Coöperative Service

Recipes and directions for making candles, inks, beet sugar, for tanning skins, for school cooking, and other industrial activities can be had at low cost (5 cents to 50 cents).

b. From the Sea Arts Guild

Charts and directions, with illustrations, for making and painting all kinds of ships — private, clipper, Egyptian, Viking, Spanish (Santa Maria) — cost from 50 cents to $1. They are complicated for children but are excellent for use as suggestions.

c. From the Junior Achievement Bureau

Directions and equipment for sheet-metal work, shoe repairing, painting and varnishing, millinery, leather working, and art metal work.

CHAPTER FOUR

ENGLISH ACTIVITIES AND MATERIALS

LANGUAGE; LITERATURE; READING

PROBLEMS; VALUES English work in the elementary school covers a wide field and includes some of the most difficult problems the teacher and children must solve. On the other hand, if these problems are wisely solved, there are many delightful experiences and rich rewards in store for every one concerned. Interests will broaden, experiences grow richer, creative imagination will be stirred and organized; beautiful words, phrases, and figures of speech will slip into use, vocabularies grow by leaps and bounds, and some intelligent appreciation of good English and real literature may be developed. The ability to talk and write well, to use books independently for information and pleasure, and familiarity, furthermore, with some of the masterpieces of literature are also practical possibilities — not only of present value, but likely to bring joy to future teachers in high school and college.

SELECTION OF MATERIALS The selection of suitable materials is a most vital factor in achieving these results. All educators emphasize the responsibility to the children for the right thing at the right time, and urge that it is a serious matter to teach a child to read and then fail to see that he reads wisely.

Certainly it is poor judgment to stir a child's interest, set him to thinking on a certain topic or working on a certain activity, and then to pull him up suddenly because the

need for further information and help cannot be met — or, worse, to meet it with inaccurate information.

It does seem absurd to talk or read about things far away from a child's experience and interest when there is now at hand such a wealth of material suitable to meet his needs. It is also useless to give the pupils rules and directions for correct speech and then to provide poorly written books for their reading or to allow careless speech and composition. Trivial content and crude expression can never produce literary taste and judgment.

It seems evident then, that work in elementary English should have to do with something the child can understand; and this again brings up the matter of experiences — physical, social, and artistic.

As has been noted so often, young children have had very few experiences. They do not really understand many of those that they have had, for children take familiar things for granted. Again, what they do know is very local; very close to home. Except in unusual cases they are still too young to have been very far afield even in their own community — still less in others. A country child knows little of street cars, elevated roads, or subways, parks, the Zoo, and many other things which are part of the city child's daily life. The latter, especially if he is a slum youngster, has no possible picture of wide-plowed fields, cows in a green meadow, or the big barn at feeding time, pictures so commonplace to the child on a farm. Tales of the mines, the great forest, cornfields and cotton plantations — even fanciful stories — must have a solid basis in reality to which at least an imaginative string may be tied; otherwise the elementary school child cannot get any true sense out of them.

It is this practice of having children read and try to talk or write about things they cannot fully understand that is

responsible for much of the word calling as well as for the absurd half-knowledge, the distorted ideas, and the inaccurate information that they so often have.

As experiences accumulate, naturally the children can put two and two together and get new experiences at second hand in books. A boy who has rowed a boat, paddled around on a raft in a pond, balanced himself on a small log, or seen a jam of sticks and leaves in the backwaters of a brook, has gained a basis of experience that will make him thrill with understanding when he reads stirring tales of logging on a great river, or follows in imagination the voyages of explorers into inland waterways. This does not mean that facts are all important nor that there should not be free opportunity for imaginative play and fairy tales; it means that all these things, real or fanciful, should fall within the child's ability to understand.

It is also most important that there should be careful standards of good English. All the English which the children use, whether in oral expression, school-made chart, or real books, should have literary quality, if possible. Certainly there should be correct form, clear, definite language, and careful organization. Incidentally, the scientific fact and the fanciful story require totally different methods of presentation.

A special word about humor seems in order since the value of that quality in the elementary school is often overlooked. Humor, fun, or wit has a place in all school English work. A sense of humor is a precious possession which should be cherished or developed, as the need may be. Much can be done to that end. The very young children can only see the obvious fun, the horse-play kind of humor, the grotesquely comic; but this should gradually change to a keener and more intellectual enjoyment of many kinds of humor, in both books and life. Certainly the comic supplement and

the crude movie — both thoroughly pernicious for children — do *not* contribute to such development.

And lastly, the children's diet of English should be as carefully balanced as their diet of food. Stories, poetry, description, comment, information, all belong there. Just here it is worth while to note the danger of using stories too exclusively — particularly in the upper grades, where real information is needed. In reading fiction the child is prone to skip this information bodily while he follows the story, or else it becomes so tangled up with the plot that fact and fiction are confused in his mind. Again, the information given in story form is often poorly written or inaccurate, sometimes even absurd. Still worse, the children become so used to the stimulation of plot and movement that they do not like to read facts or to dig for information; they want all the material sugar-coated and predigested. Here is another case of too much candy and not enough bread and butter. A further discussion of the above points is found in *The School Library.*

KINDS; METHODS

In looking over all phases of elementary English, we find that the work falls into three groups, language, literature, reading — all closely interwoven, all using the same materials, and all going on at the same time informally and naturally, with the balance of taking in and giving out carefully considered.

First: *Language.* This is a flexible term which covers all expression through speech and writing. General conversation, discussing books and pictures, making plans, talking over an experience, reciting a lesson, telling a story, acting a play or dramatizing some incident, composing and writing a letter, poem, essay, or play — these are all types of language work. No separate period for language teaching is required,

since it is impossible to separate the *expression* from the *content* or meaning, to be expressed.

Wisely developed, this language work develops the ability to think clearly and organize quickly; a full, flexible, usable vocabulary; usable knowledge of grammatical forms; and above all growth in expressing effectively — either in speech or in writing — something which is worth while to both speaker and hearer.

Wonderful possibilities are found especially in that interesting type of creative material which comes first hand from the children's own experiences or connects closely with their real interests and activities. Here is something which really "belongs," and which has the significance and the vital interest that books often lack. When the children understand that there is a real reason for all this effort there is likely to be plenty of interest in doing work in the very best way; in selecting words which say precisely what is meant; in checking up all statements, in hunting for a nobler phrase or a lovelier thought to express a given idea; in being sure the rules of grammar are followed. This is language work in a most vigorous and effective form. There is also a sense of moral triumph and creative achievement, for who knows a more joyous or a more wholly satisfying thrill than that of *authorship!*

Not the first-graders who march so proudly out with their first primers — a simple "story" in few words of the circus parade which came last week. They told the story to the teacher, who printed it for them on big pieces of paper, with plenty of room left for pictures of tigers and clowns, elephants and gayly trimmed horses! The pictures are there too (though some of them need explaining by the makers), and the covers of each "book" were put on by the small owner.

Not the second-grade people. They review past trials,

hard work, and real achievement as they read again the chart record of the garden, dictated by them, printed by the teacher; made first on the blackboard and then printed in good form, week by week. "This is well done," they say. "It tells us when to plant our corn; what happened when we forgot to water the tomato plants and when we were too lazy to pick off the potato bugs. We will keep it to help us in making our next garden."

Not the children in the third and fourth grades who smile happily over the pile of "books" just mimeographed, as they say, "Here is our story about boats, all ready to read again and take home for every one to read! We hunted in many books and asked questions, and went to the museum, and looked at pictures, and found out all we could about boats; then we made this tale just as true and real as we knew how. Our drawings are like the models. Miss Simms wrote on the board the things we wanted to say, and we all worked, every single one of us!"

Not shy Elsie in the fifth grade, whose dainty verse about the wind in the tall pines made others see the swaying trees and hear their music, as she hears the children praise the lines and choose them for the school book of original poems.

Certainly not the sixth-grade playwrights, whose manuscript copy of "Robin Hood: A Play in Five Acts," bound with drawings of costumes, stage directions, and cast, is the treasured possession of the county office and shown to all visitors.

This type of material can be worked out with the children practically as follows. Always the teacher must lead and stimulate and develop new interest, for children do not do the work spontaneously at first, though later there is a great growth in their ability. The making up or composing is done in different ways. Sometimes the children work as a group with the teacher, the children dictating, each in turn

giving his thought or phrase, the teacher writing on the blackboard, all criticizing and correcting till the whole is satisfactory and ready to be put in permanent form. Sometimes each child works individually on an assigned part, for which he is personally responsible. Thus Alice works on *Linen Cloth* for a grade book on fabrics, or Sam on Act II of *The Adventure of Friar Tuck.*

Again, each child may write his own version of some play, story, or fact, and submit this to the whole group — the teacher included — which selects the best production for the purposes in hand. If none is acceptable, different versions are combined and adapted by the group or by assigned committees. This plan for older children only. Still again, each child may write his own story, poem, or record and then correct it and make his own copy for his own personal use, or for duplicating. Young children dictate instead of write.

The subject or topic may be drawn from any interest, activity, or other source. A school topic in geography, science, or history; an immediate interest, such as a circus parade; a story, poem, or book may serve.

The composition may take the form of a story, a play, a poem, a record of a trip or an experiment; observations made in science or other work; plans worked out — or whatever best suits the material. There is excellent opportunity here for having children see the value and meaning of "style" in writing.

This work is put into final shape through writing or through printing (by hand or device), and may be in duplicate or single form, bound or left as it is, as described presently.

Other language problems, also, are of importance.

Grammar in the elementary school is chiefly a matter of making the use of correct form in speaking and writing a

habit with the children. This habit is established by constant practice. An oft-repeated question or frequent mistake suggests that a certain rule must be learned.

Written Composition is more of a problem, since it calls for the ability to write as well as to compose.

Needless to say, the basis for all writing should be something to say and a desire to say it in writing.

The primary children should write about facts and experiences, and should always dictate their poems and other *literary* efforts to the teacher or to some one at home, for enthusiasm and freedom of expression are soon killed by trying to write before writing skill has become automatic. The earliest practice in writing is on the blackboard (for at least three months) and is postponed, if possible till the second half-year. All early writing should be large, the form gradually decreasing to adult size by the fourth grade. As in other subjects, the drill in form or technique should come after the need for that kind of skill is felt, and where the child wishes to produce attractive pages and clear forms.

Expression through writing, as just suggested, requires technique, and the problem of gaining this technique is a difficult one for no method seems entirely adequate.

Manuscript writing (the form of lettering used in books before printing was invented), new in this country but well-tested in England, represents a marked advance in this kind of work and is finding enthusiastic support where it has been tried. Supervisors and principals should investigate. After the first shock is over it usually makes a strong appeal.

Second: *Literature.* This is the art side of work in English. In any story, poem, or other material that is really literature, beauty of language, thought, and form must inevitably be present. A piece of literature may be fact or fancy, its style realistic or imaginative, its form prose or

poetry, essay, narrative, story, drama, or what not. The word literature does not necessarily mean *Paradise Lost*, *Hamlet*, or the *Inferno;* it connotes any piece of writing which obeys all the laws of art. *The Old Woman and Her Pig*, as well as any of the above classics, has its literary claims.

The study of literature in school should help the children to know and love so well some of the beautiful things by fine authors that they will reach out after more and will choose for their pleasure artistic and well-written books.

Both the great and the lesser pieces of literature must be sympathetically presented by the teacher, who at the same time should offer aid in understanding them. Discussion of the selection, calling attention to its beautifully chosen words, its special thought, its rhythm, its meaning — all this can be carried on naturally with the same give and take that we note in the discussion of a new book by a group of adult friends. There should be a sort of open forum in which teacher and children have free and frequent opportunity to re-read or re-tell what had not been clear to them or something which gave special pleasure. The children should be helped to express in some beautiful form their own feelings, thought, and ideals. No slipshod, slangy language should be allowed in this work; no hit-or-miss organization or rowdy fun. The ideal plan will call for clear thinking and for the careful choice of appropriate words in which to express the thought, with rich imagery for embroidery.

Story-telling, reading aloud, dictating and writing, describing, dramatization are all forms of literary expression. As a general thing the children should tell original stories rather than retell those they hear — though a certain amount of retelling is allowable, especially with little children, who love repetition.

The written work in literature should be original. A

child makes up a new story, or, better still, writes in his best way poems or brief little descriptions. If familiar tales or themes are used, the task should be to put them into dramatic form, which really means creating something entirely new. Thus *Robin Hood* is made into a play by the fifth grade — first written, then acted. As suggested above, only the older children should attempt much of this kind of written expression.

Dramatic play or dramatization is perhaps the happiest form of literary expression. This is discussed in the chapter on Play (p. 172).

Third: *Reading.* This is the technical problem of English work. It involves the process of getting thoughts from printed or written symbols. Reading is of tremendous importance, for it constitutes a practical tool which is used in everyday life for information, short cuts, and such purposes, and to-day is even a matter of life and death. It also brings much joy and satisfaction if wisely used.

Teaching reading in the elementary school includes teaching the child to master the symbols and then put his acquired knowledge and skill to rapid, accurate, wise, and economical use — all of which is a very complicated process.

The content of the reading materials has already been discussed.

The method of teaching reading has been so fully discussed in the many books on this topic (see Appendix) that technical details are not given here. But after all, children learn to read only by reading, and since teachers are chiefly concerned with awakening their interest and getting them to read independently, some help may be needed along these lines.

The best beginning is made through the use, in the very first reading lessons, of the children's own work and experi-

ences — recorded on the blackboard and on the school-made chart and primer pages, and so connecting the familiar fact with the printed word. Easy readers containing old, loved tales and rhymes and simple realistic stories, and leaflets, also, follow and supplement these records. Then the pupils are introduced gradually to the real books and other printed matter that are used by every one as a simple and natural method of satisfying interest, curiosity, and the need for information.

The need for information should be established before the answers are sought. In science, geography, history, or other work, the constant problems that come up lead to study and books, which give the needed help.

"How do the bees make honey and wax?" — "Here's a book about bees; read it and find out." "How did the shepherds care for their flocks?" — "Get *Weavers and Other Workers* and we'll soon know." "What did Pinocchio do next?" — "There is the book, find out for yourself." "Tell me a story!" — "I haven't time, but here is a book, read a story, if you wish." "How did the Indians build a wigwam?" — "There are several books about Indians on the shelf; one of them will surely tell you." "How is turpentine distilled?" — "Look in the encyclopedia." "Who live in the West Indies?" — "We haven't a book that tells us much about that. Suppose we write to some Steamship Company and see what their advertising matter says." "We are soon to be ready for the Eskimo house-building. Find out all you can; there are some pictures and leaflets in the Library."

As the children become accustomed to this, more responsibility for finding their own materials can be put on them. The assignments become more frequent — as: "John and his committee may report on the planting and cultivating of cotton; Mary and hers on the picking, ginning and baling." Or, "Frank is to look up the Indians' method of making

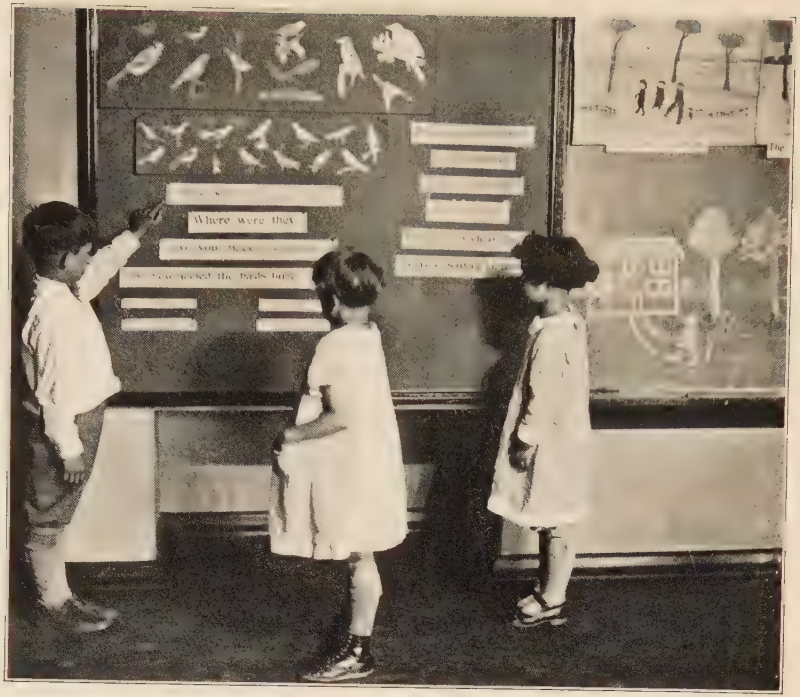


PLATE XI. BEGINNING READING

An effective use of the bulletin board with primary children, Fort Wayne, Indiana, Public Schools

PLATE XII. REFERENCE READING

Sixth-grade boys reading books and stories about the Middle Ages for help in writing and costuming their play, *Robin Hood*
(Courtesy of the Chicago Public Library)

houses, Sara their manner of cooking, and Jack the way they got food." Or, "Who will find out when and how the first steamboat was made?"

An interesting book or magazine in plain sight; lists written on the blackboard; other children's reports on books: interesting posters — these are other suggestions for attracting the reading interest.

The normal child should leave the sixth grade well able to use books in this topical way, and to read freely and digest quickly all subject-matter that lies within his real or imaginative experience. He now has a key which he may use at will.

Another method in arousing and stimulating interest in reading is reading aloud to children. This is excellent if not overworked. When a child makes his first acquaintance with a beautiful poem through hearing it read aloud well, the poem has much more significance for him than if he had read it for the first time by himself. This is true of some prose, also. Children turn again to something they have heard and liked. Reading aloud part of a story or book to children and then leaving the children to finish for themselves is often a good plan. Sometimes it is helpful to tell a few facts and then send the children to books for more.

Where the children are poor readers, it is sometimes wise first to read aloud an assignment and then have them read it to themselves. When they have some idea of the nature of the material it is much easier for them to follow the text. This plan may also be used with little children. It is necessary to be very careful in this, however, for children — especially the quick ones — soon become lazy and refuse to read for themselves, or else lose interest because the material is somewhat familiar.

As has been said elsewhere in these pages, it is most desirable to get away from the idea that children can read only

things written for children. Always they should be encouraged to use freely all good available books, papers, magazines and other printed material. This is taken for granted by the fourth grade. The more quickly a child assumes that he can read any book, the more quickly he will be able to do it. There is much valuable material in adult books which children can easily understand and yet is often lost because both teacher and children are afraid it is too hard. In reading as in other matters, most children respond quickly and surprisingly to confidence and to what is expected of them.

HELPFUL REFERENCES Books and pamphlets which give helpful information and advice will be found in the Appendix.

MATERIALS; EQUIPMENT The materials and equipment which follow serve the needs of all types of English work. Some of the supplies are created by the children, some come from outside sources, and still others are found in various printed forms. The most important source of all, it goes without saying, is books. Suggestions for certain phases of the work are found in Play Activities and Constructive Activities. Others are listed here, as follows: I. School-Made Materials. II. Ready-Made Materials. III. Books. IV. Writing Materials. V. Additional Equipment and Supplies. All addresses are listed in the Appendix. All prices are approximate.

I. SCHOOL-MADE READING MATERIAL

School-made reading material of great diversity is now entirely practical for any school. It is inexpensive, and it makes possible wide interests and great variety in reading matter; and where books are few it is a treasure indeed. Some of this work, such as making charts and printing in

primers, must be done by adults, since it requires accuracy and great care. Some of the children however — the older ones, particularly — may freely use the printing outfit and the sign marker for making their own signs, labels, lists, and some of the drill materials.

Such material, designed to meet a special need of a particular group of children in a given school, has a value which cannot be overestimated. It helps the teacher to tie up the reading with other subjects, adds to the child's interest, develops creative power, and often holds the attention of fact-minded, unimaginative, non-literary, or beginning groups.

a. Reading Charts

Charts are indispensable all through the elementary school. In this form it is possible to keep group records of all kinds, and also to collect the scattered blackboard reading lessons of the younger children and make the transition from these lessons to real books. When not in use, charts are easily cared for if rolled and labeled. (See Where to Keep Materials, p. 326.) If the charts have been carefully selected, those which are kept will form a valuable collection for reference and to provide excellent supplementary reading material for the younger children, who enjoy reading and re-reading not only of their own doings, but also of those of their older friends when "they were in our room."

1. *Topics; Material*

Any topic which is of sufficient interest or value to the children may be used. The teacher must decide this point.

(*a*) Younger children are usually most interested in telling of the things they are doing, or have just done, or in familiar rhymes or verses. The story of some rabbits that were given to some primary children at Easter made a continued-story chart which was read again and again, and then a year later called for by the group when they wished to see how large a house for four rabbits should be. *Mother Goose* and other rhymes and verses made a poetry chart so loved of its readers that a book "just like it" was demanded and later — thanks to the hectograph — obtained. A third-grade chart was made of a series of recipes, one recipe being added each week.

(*b*) The older children like to tabulate observations and to make work drawings and plans for a project. One fifth grade kept a garden record all the way through a year, noting fall, winter, and spring conditions. Another chart held the most detailed plan of a school-grounds project, with notes on the work assigned, and with the various results checked up.

2. *Organization; English*

The material should be carefully adapted and organized before it takes its final shape on the chart. Rules for composition and punctuation must be carefully worked out and a suitable style or form (narrative, dramatic, tabulated) for the particular type of material decided on.

(*a*) The primary charts follow the rules for all early reading; they must present complete units of thought. The tiniest of stories has its beginning, main discussion, climax, and end clearly defined, while every record holds to its own facts and keeps out unnecessary and by-the-way data. The sentences are short; the words simple but well chosen (no one-syllable or "talking-down" effect) with plenty of repetition, change of sentences, form and other points noted above. The first charts are very short; later they are much fuller and the material covers a longer period — sometimes over a whole year.

(*b*) With the upper-grade charts, which are usually tabulated records of observations of work or plans, special care should be taken to get rid of useless data, to put in all needed facts, and to organize the material by the best and most easily read method.

3. *Construction*

(*a*) Use medium weight Manila wrapping paper (p. 98) (sheets or roll) with plain surface, 32 to 36 inches wide and about the same length.

(*b*) Draw the lines lightly with a pencil, twice the width of a letter apart; erase them after printing the text.

(*c*) Print with a stamp outfit (p. 275), or letter by hand with a lettering pen (p. 275); tall letters, 1 to $1\frac{1}{2}$ inches for small groups close to the chart, and $1\frac{1}{2}$ to 2 inches for reading from anywhere in the room. Space between words should be about the width of two letters.

(*d*) Leave a balanced margin on each side of the paper if pos-

sible, but do not break the lines on a beginner's chart in order to do it. On other charts the lines may be broken.

(*e*) Mount as follows:

(1) Paste a strip of unbleached cloth about five inches wide on the upper edge of each printed sheet, with a lap on the paper of two and one half inches. Rub the strip smooth and press it flat till it is dry.

(2) Place the sheets together, edges even, sew through the cloth at the extreme upper edge, then tack the material on a pole or a stick (an old broom handle or a curtain pole) that has been cut to extend two and one half inches beyond each end of the paper.

(3) Tack a string or a piece of tape at each end of the pole so that the chart can be hung on the wall; if desired, an easel can be used instead, or the sticks of the chart can be rested on two wooden pegs or on large nails in wall.

b. Duplicated Poems and Other Material from Books

Collections of poems and stories often omit the very thing wished for; it may be necessary to buy a whole book to get one special selection. For this reason, a teacher or supervisor who wishes to select special material finds both economy and satisfaction in this plan. First copies are made by hand, or on a "Great Primer" typewriter, and as many duplicates made as are needed, usually one copy for each child, and a few extra copies. These are used singly or are bound into booklets. They are given to the children or else kept at school in sets for supplementary reading.

c. Booklets

A collection of booklets of many kinds will give variety to reading, develop creative power, make available much interesting material that would otherwise be lost, are very inexpensive when compared with most books, and, moreover, are light and easy to handle. They are often illustrated by the children's work — drawing, painting and cutting, and are made in any desired size, and bound as directed in *Elementary Industrial Arts* (Winslow); also in *The Toronto Method* (from Gaylord). They are used as any other books.

1. *Reading Booklets*

(*a*) Hectographed or duplicated sheets as above (copies of

children's work or of selections from books) may be bound into booklets, illustrated, and attractively covered. All typing for these booklets should be "Great Primer" size, double spaced. Manuscript writing (p. 139) may be used instead of typing.

(1) The first primers for beginners are of this kind, the material, of course, being very simple and the pages few. Later in the year other "readers" are made in the same way — for example, "Garden Book," "Book of Pets," "Farm Reader," etc.

(2) Longer stories, or series of stories are made by older children. Books of poetry are often made.

(*b*) Leaflets or other printed sheets (p. 152) of interest to children, that are now obtainable, may be collected and bound.

(*c*) Stories from worn-out primers, story books, and old magazines are often removed from their covers, mended, and remade into booklets. They are thus saved for long usefulness.

2. *Illustrative Booklets*

Illustrative booklets made by each child as he wishes, for health work, nature study, or geography, are worth while when they grow out of real work and are original in plan.

3. *Picture Books* (pp. 210, 238)

Picture books, with some simple reading in words, phrases, or short sentences, are very important for children who are just learning to read, as they help over the transition period and establish in the child's mind pleasant associations with books. If classified and arranged by topics, picture books have value also as forerunners of the book which gives "information," for good pictures with various labels or short descriptions will illustrate and make clear some of the school work.

(*a*) These picture books should always have artistic quality, with good pictures, paper, and binding; uncrowded, well proportioned pages; proper spacing, wide margins; and attractive printing well placed on the page. From ten to fifteen sheets will make a good-size book.

(1) The inside sheets may be of Manila paper, construction paper, or kraft paper of cream or tan color, with dull surface, or may be of heavy unbleached cotton or linen with picot edges (hemstitched on the machine).

(2) The covers should be of strong cardboard, covered

with paper, art oilcloth, cretonne in rich all-over patterns, or figured wall paper — all the material in colors which do not easily show soiling. A coat of shellac (p. 110) will protect and strengthen the paper covering.

(*b*) The following topics are suggested:

(1) *First Grade:* Children at play; pets; animals of all kinds; home activities; farm activities; mothers and babies; birds; flowers; boats.

(2) *Second Grade:* All first-grade topics; houses; furnishings; industrial activities; landscapes; Indians; Eskimos.

d. Materials for Work, Play, and Other Activities

1. *Directions*

Directions printed in large or small size placed in the room — on the bulletin board or on the children's desks — give excellent practice in reading, and are of real value, since they save time for both teacher and children, and since by them, furthermore, the children learn to work independently. Examples of such directions are: "Section B; Work on Booklets," "Bring lunch tomorrow," "Put on hats and coats." More detailed directions for certain work are also used.

2. *Announcements on the Bulletin Board*

Announcements such as "Cocoa To-day 5 Cents," "Cafeteria Bill of Fare," "Garden Work instead of Art, at 10:30," keep the children alert and also motivate the desire to read. Announcement of numbers on a program — as "Music by First Grade" — are printed on large strips, which are held up by the children or placed on an easel board.

3. *Signs and Labels*

These are made by the children (with stamp-printing outfit or by hand) for real and play use, and are very valuable as reading aids. Such signs as "Wet Paint," "Walk on the Path," and "Private"; also book labels, tags for the chalk box, the scissors box, and other property; garden markers, as "Lettuce," "Sweet Peas"; price marks for sales, and so on, are made to serve a real need. "Sanitary Grocery Store," "City Hall," "Main Street," and other signs and labels, such as "Salt," "Potatoes," "Vegetables for Sale," give a touch of reality to play (p. 176).

4. *Posters*

Advertising posters, for example, "Book Week," "Our Pageant," and "School Bazaar," are made by children. They also print, in poster form, programs for entertainments.

e. Drill Materials — Flash Cards; Letter Cards; Phrase Strips; Cut-up Stories and Rhymes; Puzzles; Word Games

These materials are easily made at school. Made in that way, they fill each teacher's special need better than the purchased materials. The teachers and the older children print them by hand or with a stamp outfit on heavy Manila paper or on cardboard. Such devices are used to help the younger children and the slow readers to a quicker recognition of words, and have a distinct value, especially when used with large groups of children. Sometimes they are used as seat work, sometimes as class work.

Large strips of cut-up stories may be thumbtacked to the board. All printing should be clear and of good size.

II. READY-MADE MATERIALS

Various kinds of material for reading, already printed, may be had free, at small cost or at regular prices, and gives very practical service. Not only books are available, but pamphlets and leaflets and also such outside material as post cards, travel folders, letters, printed rules, street signs, newspapers, and magazines.

a. Outside Reading Material

A great wealth of reading material lies within easy reach of all children, material which is in vital touch with real life, gives interesting facts, correlates with school activities, and contributes to personal safety and well-being.

1. *Picture Post Cards* (p. 235)

Picture post cards bearing printed descriptions have many possibilities. Collect as many as possible, through exchange or purchase, or as gifts. They will furnish the children pleasure as well as information.

2. *Travel Folders and Advertisements* (Rail, Motor, Air)

These are not only full of most interesting and accurate in-

formation but often have real literary and artistic quality and carry beautiful pictures. Any travel bureau or agent will respond to requests for them. They have direct connection with geography and history work.

3. *Letters*

Letters offer still another form of reading material. Those received in exchange from other children and schools are most interesting. Those that come in answer to orders for material and requests for information give help in understanding the proper form and wording of business communications.

4. *Printed Rules and Directions*

These may be read and used by the children, often without supervision, from the third grade up.

(*a*) Rules for games (dominoes, parchesi)

(*b*) Library rules ("book-due" dates, fines)

(*c*) Directions for use of school equipment (hectograph printing outfit)

(*d*) Directions for mixing or preparing material (mixing cement, putting color in paint or in calcimine)

(*e*) Recipes for cooking.

5. *Street or Road Signs and Numbers*

Traffic signals are very important to safety and convenience; children should be taught, as they come to school, to read and observe them.

6. *Newspapers, Weekly Publications, Magazines, Special Supplements*

These have endless possibilities, from the first grade up.

(*a*) *News* (both local and domestic) has a valuable place in a child's education. Well-chosen topics of local interest (good roads, the new school building, garden campaigning, books for the library) may be read to the children and discussed with them, then posted on bulletin board.

(*b*) Real literature is found occasionally.

(1) Fine poems and charming bits of essays appear in newspapers and weeklies. Cut them out, paste them on cards or sheets, and encourage the children to read them — either individually or in groups.

(2) Essays, poems, and short articles can be easily removed from old magazines, and, after the pages have been stitched together, used for reading matter. Be sure to caution the children about mutilating library or bound copies. *Harper's*, *Century*, *Scribner's*, the *Atlantic Monthly*, the *National Geographic Magazine* and other periodicals containing historical and scientific material, will yield much that a keen fifth or sixth grade child can enjoy — either in hearing or in reading. This method of using current magazine matter forms the child's taste for good periodicals. It is a plan that should by no means be put off till high school years.

(*c*) *Pictures* and *cartoons* with descriptive reading from the special supplements of newspapers are most interesting. These help children in general reading and encourage interest in current happenings. Have the pupils bring them to school, allow time for looking at them, and then post them on the bulletin board.

(*d*) *Advertisements* in papers and magazines are full of possibilities.

(1) Advertisements of food, and house furnishings, especially those that show family life, interest little children, and the large lettering and gay pictures make easy reading. Encourage the children to read advertisements at home and on the cars — with or to their parents.

(2) Older children find new words and acquire new skill in reading other "ads." They may hunt for special firms and addresses in the advertisement columns.

b. Pamphlets; Leaflets

Pamphlets and leaflets on a great variety of subjects are now published by many firms; they cost from one to ten cents each. Often the selections — particularly the poems — are very good, but usually the print is too small, and frequently the notes are troublesome — so teachers should send for samples before ordering. Poor type is the cause of much eyestrain, and children should be protected against the danger that lies in reading it. Primary teachers, especially, should always insist on large, clear print and avoid crowded pages.

The *Francis Parker Leaflets*, Francis Parker School, are especially recommended. These are charmingly written, well printed, and give valuable information. The children enjoy them and the teachers, in reading the material with children, will find

excellent suggestions for creative work. A full set of these leaflets should be owned by the school, and the set on "The Farm" and "Indians" (first and second grades) and "Food" and "Lumber" (second grade) should be in the hands of the children. These average about 15 to 20 cents a set. *Travel Pockets for Children* — six sets at $1.50 the set; $4 for three sets; $8 for six sets — come from the National Geographic Society.

Upper grade teachers will find certain industrial pamphlets and poetry leaflets (p. 211) most helpful. These can be had at low cost from A. Flanigan, Unit Press, The Owen Publishing Company, D. K. Knowlton, The Penn Publishing Company, G. M. Parker, and B. F. Taylor.

c. Seat Work; Drill Materials

There is much prepared seat work in reading on the market. The *Winnetka Individual Instruction Materials* in language, reading, and phonics are published by Rand, McNally, and teachers interested in this experimental work should investigate. The following selection was made by a progressive supervisor for use in a city system:[1]

Merton's Work and Study Projects. Published by Laidlaw Bros.
Set I, Grade I, Revised.
Set II, Grade II, Revised.
Set III, Grade III, Revised.

Educational Seat Work. Published by The Plymouth Press.

G3022	Illustrated Vocabulary I.	1st Grade
G3023	Illustrated Vocabulary II.	
G3024	Illustrated Vocabulary III.	
G3025	Illustrated Vocabulary IV.	
R921	Seat Work in Classifying I.	
R922	Seat Work in Classifying II.	

Silent-Reading Seat Work in Picture Building. Published by The Plymouth Press.
R933 Noah's Ark, 1A Grade.
R934 The Toy Shop, 1A and 2B Grade.

Silent-Reading Group Project Playlets. Published by The Plymouth Press.
R929 Child Life I, 2d and 3d Grades.

[1] Seattle Public Schools.

Silent-Reading Seat Work. Published by The Plymouth Press.
R917 Home Activities (Drawing), 2d and 3d Grades.

Silent-Reading Seat Work for Primary Grades. The Harter School Supply Company.
No. 2002 Elliptical Stories, 1A and 2B Grades.
No. 2003 Thought Questions and Answers, 1A and 2B Grades.
No. 2005 Picture Making, 1A Grade.
No. 2007 Riddles, 2d and 3d Grades.
No. 2008 Classifying Words, 2B Grade.
No. 2024 Pairing Words and Pictures, 1B Grade.
No. 2029 Tablet Pictures, 1st and 2d Grades.

Silent-Reading Seat Work. The Harter School Supply Company.
No. 2094 The Foxy Squirrel, Color Completion Stories, 1st and 2d Grades.
No. 2077 Folklore Friends, Stories to Read and Color, 3d Grade.

Self-Teaching Cards for First and Second Grades. The Harter School Supply Company.
No. 2066 Picture Word Cards, 1st Grade.

Silent-Reading Seatwork for Use in Primary Grades. Published by Ideal School Supply Company.
No. 285 Series One, 2d and 3d Grades.

Story-Building with Blocks. Published by Milton Bradley Company.
For 1A Grade.

d. Readers

1. *Primary Readers* (see Library References in Appendix)

Choose those which have the most satisfactory subject-matter, vocabulary arrangement, and mechanical make-up (see any book on reading), and which will best help the beginner bridge the gap between the early chart or the school-made primers and books in general. There are many of these.

(*a*) So-called *basic readers* are owned by the children or the school and are usually read in full orally, and worked out carefully in detail at regular reading periods. Needless to say, these must be well balanced by blackboard work, charts, and other materials listed. The first grade reads from three to six of the readers; the

second and third grades read from two to four; other grades use, in most cases, books instead of readers.

(*b*) *Supplementary* readers are owned by the school — sometimes one copy for each child in a section; sometimes in smaller sets, often only one of a kind. It is desirable to have as many kinds as possible. They are used occasionally for oral reading, but most often for silent reading with or without supervision. Real books, such as *Peter Rabbit* and *Little Black Sambo* and pamphlets and leaflets are also included under this term. Such material should be very easy if individual silent reading for pleasure is to be encouraged. First readers (unfamiliar) make excellent supplementary readers for the second grade, second readers for the third grade, and so on.

2. *Readers for Slow Children in All Grades*

These are sometimes needed for the same reasons that they are needed in the primary group, and the same type of reader is advised, though, of course, the subject-matter must be new. Often the phonic reader, not advised for average groups, serves a good purpose. Children who have very great difficulty in learning to read at all must be handled as individual cases and are not considered here.

3. *Books as Readers*

As soon as possible, books are substituted for regular readers. Real books, as *Alice in Wonderland, Heidi, The Story of White Patch, Hexapod Stories,* and others.

III. BOOKS

Books and the varied problems involved in where to get them, how to choose them, how to take care of them, are fully discussed in *The School Library* (pp. 199, 216). Classified book lists covering different phases of the work are given in the Appendix, Part One.

IV. WRITING MATERIALS

a. For Script Writing

1. *Blackboards* (p. 307)

All early writing should be done on blackboards.

2. *Paper*

All paper should be of dull finish to avoid glare and reflection of light. This kind of paper comes from any bookstore, print shop, or school-supply house.

(*a*) The first writing is on large sheets.

(1) First Grade, 18 × 24 – 12 × 18, ruled in two-inch spaces, gradually decreasing in size to

(2) Second Grade, 9 × 12 paper in one-inch spaces, and

(3) Third Grade 9 × 12 paper in half-inch spaces.

(*b*) Older children use paper of any size desired.

3. *Pencils and Pens*

(*a*) A pencil of large diameter — "Beginners' lead pencil" — is advised for the first and second grades. These pencils are carried by all supply houses and cost about 5 cents apiece; much less in quantities.

(*b*) Regular pencils (Dixon's are recommended) and ink with ball end pens may be used in the third grade, and upward.

b. For Manuscript Writing

See books on manuscript writing listed in Appendix.

V. ADDITIONAL EQUIPMENT AND SUPPLIES

a. For Mending and Making English Materials

1. *Tools*

Paper cutter (p. 273), shears (p. 125), printing outfit (p. 274), duplicator (p. 270), punch; awl (p. 276).

2. *Constructive Supplies*

Paper (p. 95), paste (p. 104), tacks (p. 83).

3. *Special Book Supplies* (pp. 215)

b. For Taking Care of Materials

1. Racks for Charts (p. 336)
2. Shelves for Books (p. 329)
3. Book Ends (p. 215)

c. For Using Materials

1. *Easel* (p. 117)

An easel is used for holding charts, small bulletin boards, and reading strips.

2. *Chart Holder*

A device for holding built-up charts (combining cut-up material) is sometimes a convenience. The "Plymouth" is satisfactory.

3. *Bulletin Board* (pp. 42, 305)

The bulletin board is used freely for posting clippings, notes, and other English material which children should be encouraged to read.

4. *Reading Table* (pp. 296, 297)

There should be a reading table (round preferred) in every classroom.

CHAPTER FIVE

ARTISTIC AND RECREATIONAL ACTIVITIES AND MATERIALS

ART; MUSIC; PLAY

A. ART

PURPOSE; VALUES

Art Education in the school should develop, as noted before, the power of expression, a trained appreciation, a certain amount of knowledge and information, and an ever-growing interest in fine things.

The children express their ideas in free creation — in drawing, painting, cutting, modeling, and in other ways. They also use paint, calcimine, wood, and cement for beautifying or decorating the schoolroom and useful articles; they plant flowers, trees, and shrubs to make the yard more attractive, grow flowers for use in the schoolroom. They arrange and place these flowers; they arrange other things to gain space, order, and balance. All this is art expression.

It differs from other activities of the same kind only in its aim. This aim, always, is to create beauty. The result may be, and often is, practical, but that is a secondary consideration. A child may paint a picture of Indians on a hunt merely to illustrate the history lesson. Or he may paint it in order to express his sense of the joy and freedom of the chase, the wild wood, the strange, fascinating men — then the work becomes art expression. The youngster wishes to make his bowl beautiful in color, form and design, as well as practical for use; to weave a rug that is interesting in pattern and color, not a mere hit-or-miss affair. To do this he must experiment, compare his work with other work of similar kind, choose, reconstruct.

Through creative work of this sort the children acquire artistic standards for color, form, and line, and feeling for balance, space, and proportion. Some knowledge of art processes and history, which always tie up with industrial history, is also necessary. Rather quick recognition of good things and a very limited speaking acquaintance with certain masterpieces are desirable — if not overemphasized.

Along with art expression, artistic judgment, and knowledge, art education should also give appreciation of loveliness wherever found — in a picture, a building, a flaming sunset, or a tall pine tree against the sky; in a soft, restful wall color, a well-planned, harmonious room, a choice bit of pottery or some gorgeous fabric. This means the ability not only to see but to enjoy; to look out for beauty in everyday life and familiar surroundings; to feel the need of this beauty because it satisfies.

Some knowledge of the laws which make things good or bad, ugly or beautiful, is essential to intelligent appreciation as well as to art expression.

POSSIBILITIES; PLANS

Into all artistic training of children many factors enter, some of them very tangible and easily grasped, others less tangible but just as real, and perhaps far more important. Many of these latter are found in the environment in which the child's life is spent. The need of either utilizing or altering this environment seems clear.

What an opportunity the outdoor world of nature offers if the teacher will but use it! Happily for our schools, the woods, fields, trees, and flowers, water, and sky, and a thousand other glories are still part of the environment of many children. Nature never makes a mistake in line, form, or color, so the lessons that she teaches are authentic. For line, what is finer than the tall, straight trunks of the pines,

stretching on in endless rows; the slender grace of bare trees against the sky or the lacy pattern woven on the ground by sunlight and the shadows of twigs? For beauty of mass, proportion, and balance, there is the distant landscape with its woods, hills, and valleys — or the intimate close-up of fence corner, brookside, or wood nook. For color, there are the multitudinous greens of early spring and the deeper tones of summer; the gorgeous autumn leaves, the bright berries and flowers of fields and woods; the rich browns and golds of dry leaves; the soft loveliness of grasses, sedges, and grains; and the brilliant sunset glow.

The indoor world of school is of tremendous importance. Here it is possible to control the standard which will make for good or bad taste.

Lessons in color, form, line, balance, and proportion are found in soft restful walls, harmonious woodwork, splashes of rich or vivid color in vase, flower, or picture, good furniture lines, a well-arranged room. These are excellent things for young eyes to find everywhere. Order, suitability, spaciousness are essentials. Always the effect of the whole room should be considered. It should convey a feeling of satisfaction without any sense of shock or jar. Small details count for much. A badly framed picture will "jump out" at the beholder instead of fitting into its place as a part of the wall. A bowl of delicate apple blossoms keeps a proper distance from a vivid lithograph in reds, browns, and yellows. Disorder in a room is fatal to beauty. Overcrowding is always to be avoided. Too many pictures or vases of flowers, too much of anything, will give a general impression of confusion. Decorations should be planned for the place they are to decorate. Suitability as well as beauty is required.

Purely decorative materials call for much thought and discerning taste. Children's handwork is rarely decorative

and should not be used for such a purpose. It may be often put up temporarily, but it should soon be taken down. "Cut-outs," paper chains, borders, posters, and crêpe-paper streamers, made with a view to dressing up the room, are very poor art. On the other hand, many useful things such as wastebaskets, book ends, containers, may be attractive as well as serviceable.

Other articles serve both artistic and practical ends. A single beautiful jar will give joy as a thing of loveliness, and at the same time set the children a standard toward which to work. Beautiful pictures quicken the imagination, develop the taste, and are useful for illustrating school topics.

METHOD In view of all this, the *method* is obvious (contact, activity, and some interpretation), and yet, too, it is obscure. No one can offer any infallible formula for getting the desired result. Each teacher must work out his or her own salvation. The child who instinctively reaches toward and thrills to beauty is indeed rare; many children go very reluctantly, it seems, along the path of artistic growth.

There are numerous pitfalls. It is so easy to make a child dislike what we long to have him love, so easy to kill a creative thought. Especially is the appreciation of art a most intangible thing. It cannot be taught, as so many teachers fondly imagine; it can only grow. Recognition, identifying, naming, have nothing to do with this growth. The child who learns that Rembrandt painted *The Laughing Man* and can readily identify the picture in a collection, has gained merely a bit of information. But the little boy who suddenly laughs aloud before the picture and says, "That old man is laughing at me," has caught the spirit of the painting and made real response to the great painter's art.

Much can be achieved, however, through tact, apprecia-

tion, sympathy, and patience. And surely lifting the art standards of children in the elementary school is worth the exercise of all these qualities. A few suggestions follow.

First: Provide the children, in their daily life at school, with as many contacts with beautiful things as possible, and do your best to make the contacts effective.

Second: Take the children on trips as suggested. Numerous artistic experiences are possible in most communities. Fine interiors and excellent bits of architecture can occasionally be found in the village church or an old settler's home, in a more modern residence, a new public building or a shop. The charming garden of some flower lover may satisfy every artistic requirement.

Third: Bring collections and art objects and beautiful books into school for the children. (See Exhibits, p. 255.) These may be borrowed from local owners or obtained from dealers or from libraries and other organizations.

Fourth: Introduce the older children to art books and miniature copies of paintings, sculpture, and illustrations of design. Furthermore, tie up the material, wherever you can, with the people who made it and the way in which it was made. This will be discussed presently.

Last (and also first): Let the children have many opportunities to express their own ideas, interests, and feelings in free creative work, and also give them practical tasks in beautifying and improving the school. (See Constructive Activities, pp. 45–131.)

HELPFUL REFERENCES Books and pamphlets which give helpful information and advice will be found in the Appendix.

MATERIALS; EQUIPMENT

The equipment and materials for Art Education are as varied as the field that is to be covered. The following are outlined: I. Decorative and Illustrative Materials. II. Instructional Material. III. Material Listed Elsewhere. Addresses are listed in the Appendix. All prices quoted are approximate.

I. DECORATIVE AND ILLUSTRATIVE MATERIALS

a. Flowers; Plants

1. *Kinds*

Flowers and plants are decorative, most helpful in the training of the children, and add greatly to the required artistic equipment as well as supply science needs (p. 23).

(*a*) Growing plants and flowers in window boxes or in pots are most attractive in the schoolroom. They are often, however, hard to keep in good condition in winter. Begonias, ferns, English ivy, wandering Jew, and bulbs are the wisest choice, since they are best able to stand alternate heat and cold. No plant should be kept after it is yellow or straggly.

(*b*) Fresh flowers from outdoors are available in most climates and places; they provide a riot of color in spring and fall.

(*c*) Ferns and evergreens are always beautiful.

(*d*) Berries, bitter-sweet, mountain ash, dogwood, rose hips, wild potato, partridge, and sumac furnish vivid color and keep for weeks, often for months. Many other shrubs and vines of garden and woods bear shiny black or colored berries which are very decorative. These plants look especially well mixed with green pine or cedar branches in outside window boxes. Change the evergreens when they become dry and brittle.

(*e*) Vines, such as English ivy, southern smilax, wild potato, and wild honeysuckle, are graceful and lovely; they look best on high shelves, in cupboards, or in wall baskets. English ivy grows well in pots and is very hardy; for winter use it is most effective if planted in orange or yellow pots with the vines trained on small trellises. Wild honeysuckle leaves keep their bronze red tones for weeks.

(*f*) Dried flowers, leaves, grasses and seed pods, left in their soft natural grayish or brownish colors (not painted or dyed) make a beautiful showing when placed in colored jars or bowls. A great bunch of brown oak leaves in an orange jar on a low cupboard makes a beauty spot for winter days. Life everlasting, or "rabbit tobacco" (Southern name), and field grasses are also effective in bright colored holders. Dried hydrangea, with its soft iridescent colors, looks well in blue, brown, or copper-colored pots, and big bunches of sumac berries, milkweed pods, pine cones, and other seed pods are attractive when used with greens or grasses.

2. *Arrangement*

The arrangement of flowers is most important. Let the children do this work and show them how to obtain the best effects.

(*a*) In school, masses of green or of color are usually best — the small individual blossom is lost in a large space, and many small bunches placed around the room tend to give a spotty effect. One large jar filled with blossoms or leaves, well placed, is much better. Do not crowd the growths or crush them together in tight bunches; that will destroy beauty of outline and form. They must be loose and natural, and look as though they were growing.

(*b*) Holders used in the bottom of containers serve well for giving a proper spreading and graceful effect.

(1) Purchase them at the ten cent store, or make them of twigs twisted together, or of cement with perforations for the stems.

(2) Drill large holes in the top and sides of a tin can for use with large, heavy branches in solid jars.

(3) Try an ordinary glass inside a bowl or a rather large jar.

(4) Use wet sand for special effects with short-stemmed flowers.

(*c*) The shape and size and color of the vase or jar count greatly. These receptacles should be simple in line and usually soft in color. Earthenware crocks, jars, pots, old churns, or pitchers are often satisfactory. Attractive jars of pottery and glass are occasionally found at ten cent stores. Colored pottery can be found in Japanese and art stores. Sometimes a coat of enamel paint (p. 90) in a vivid rich color will transform a plain jar. Glass, however, should not be painted.

(1) Big heavy things such as evergreens need earthenware jars or some other kind of solid, heavy containers.

(2) The taller flowers, such as goldenrod, fruit blossoms, and gladioli require tall jars or pitchers.

(3) Slender, single blossoms — tulips, iris, daffodils, roses — look well in slender vases or in low bowls with flower-holders to support the blossoms. Clear glass is attractive for flowers of this type, because their stems are very decorative in themselves.

(4) Short or bunchy flowers like verbenas, pansies, violets, and lilies of the valley need low bowls that are closed in a little at the top and so give support.

(5) As already suggested, bright flowers look best in containers of plain or soft colors — glass, earthenware, and vessels of gray, dull green, soft blue, and greens; while bright containers (yellow and orange, particularly) are often used for greens and grasses.

b. Artistic Work and Play Materials

Paper of interesting texture and tone; paints of clear rich color; beautiful books; playthings with charm and individuality, and other materials of artistic quality help greatly in developing taste, and the school buyer should note this fact — for already great improvement along artistic lines is being made in producing such materials.

c. Statuary; Casts (also see Museum, p. 224)

Plaster casts, bas-relief, and plaques are decorative especially when there are spots that seem particularly to need something of the kind. More often, however, their proper place is in museum collections and their use for illustration and art study, for they lack color and warmth and depend for their value — especially the reliefs — largely upon proper placing and light, which the average school room seldom can supply. The della Robbia bambini are an exception to this rule; they have both color and charm and appeal to all children.

When used as part of the decorative scheme the cast must be carefully chosen and placed and the ivory finish specified. Dealers will advise; also *School Sanitation and Decoration* (Burrage & Bailey) contains a good discussion of these problems. The casts

come in full size and often two reductions — the larger ones cost from $50 to $12; the smaller as little as $2. Plaster casts should be purchased from reliable firms only, because in poor reproductions beauty and truth of detail are easily lost. P. P. Caprion & Bros., The Boston Sculpture Company, and The Orlandi Statuary Company, are recommended. All these firms issue most helpful illustrated catalogues at 25 cents to 50 cents. The museums in large cities, also, have some modern reproductions of statuettes. The following casts are suitable for both decoration and study in elementary schools. Others may be added if there is a place for them in the school museum.

1. *In the Round*

Infant Saint John	Donatello
Singing Cherubs	Donatello
Elephant Running	Barye
Rabbit Reclining	Barye
Saint George	Donatello
Youthful Saint John	Donatello
Lion Walking	Barye
Bust of Washington	Houdon
Young Augustus	
Sphinx	
Victory of Samothrace	
David	Mercie
Washington	Houdon

2. *In Relief*

Bambini medallions, colored, from Spedale degli Innocenti	della Robbia
Choir Boys — with Book	della Robbia
Saint George and the Dragon	Michel Colombe
Chariot Race (starting)	
Triumph of Alexander	
Choir Boys with Scroll	della Robbia
Angels Bearing Wreaths	Ghiberti
Victory Untying Sandals	
Reliefs of Naiads from Fountain of Innocents, Paris	Jean Goujon

d. Textiles (also see Museum, p. 224)

An interesting piece of Egyptian patchwork, needlework, fab-

ries, India print, or tapestry, has great decorative value and if well chosen relieves a bare or unsightly spot. Expert advice is needed in making the selection.

Any of these materials has value, also, as educative material in the study of textiles — that is, the study of weaving — of textile materials, and of textile art — patterns, design, and color. The materials can be obtained from art dealers or from art decorators. Sometimes a dealer in fine fabrics will give a set of books of samples of discontinued materials or will send a current set for examination. Most of the large department stores have a department of this kind. Egyptian patchwork can be obtained from Gunn and Latchford. This firm and S. W. Brauneck also handle India prints, tapestries, and other oriental textiles.

e. Pottery; Tiles; Metal Work

A beautiful jar, tile, or piece of china, copper, or brass, is a treasure. This kind of thing, however, should be selected only by an expert and from a high-grade art dealer. Some museums have good pieces for sale, and if the case is stated definitely will also give advice as to what to purchase and where to purchase it. The Industrial Arts Coöperative Service will also purchase such pieces for its members.

f. Pictorial Maps (p. 41)

Pictorial maps in color are often most artistic and decorative and furnish interesting studies for the upper grades.

g. Japanese Stencil

A set of Japanese stencils, 9 × 12 or larger, of birds, butterflies, flowers, and trees, can be had from any Japanese dealer. Interesting sketches can be made with them. Black stenciling on thin colored wrapping paper is very effective. Thumbtack the sketch on the bulletin board or on a special wall section.

II. INSTRUCTIONAL MATERIALS

a. Picture Study Materials

Formal, or planned, picture study material is not desirable as a rule. The best results come through the informal use of many pictures, as suggested in School Pictures (pp. 229–255). For the teacher who needs planned material for use with the older children,

two satisfactory series are available at the present writing. One of these series, worked out by Frank H. Collins, is published by the Art Extension Society, Brown-Robertson; the other, worked out by Mohler, is published by the Elson Art Company. These are not advised for the primary grades.

b. Illustrated Lecture Materials

Lectures in story form with carefully prepared slides which will help the children to understand and appreciate certain types of art, and give information as well, are most delightful. They can be rented from the American Federation of Arts for about $10. Write for folder.

III. MATERIAL LISTED ELSEWHERE

Art draws freely on many types of activity and materials for its needs. Exhibits, collections, individual objects — large and small — of beauty and art value; pictures of all kinds, books of importance and books which are beautiful as to texture of paper, printing, binding, or illustrations; excursions in search of beauty wherever it may be found, and the materials with which the children work, all have an important place in artistic education in schools.

a. For Materials for Work

See Constructive Activities (pp. 61–131).

b. For Supplementary Experiences

See School Exhibits (pp. 255–260).

c. For Artistic Models

See Museum (pp. 216–229).

d. For Pictures

See School Pictures (pp. 229–255).

e. For Books

See English Activities (pp. 132–157); Library (pp. 199–216); Appendix.

B. MUSIC

Music is so highly specialized an art that only a brief statement in regard to its place in the school is possible here.

MEANING; KINDS Good music is an essential part of the school life. All teachers should heavily underscore the word *good*. Out of school they are helpless, but in school they should and must stand firm. If only good things are chosen, there will be no "jazz" or "rag-time" to jar sensitive nerves, or to stir objectionable emotions, no silly sentimental songs nor common tunes to cheapen the taste. Rhythmic work needs special attention, for many teachers use cheap music for the sake of its pronounced rhythm, forgetting its demoralizing effects.

While the music in the elementary school must provide the opportunity for self-expression, it must also develop the children's appreciation for what is fine and artistic.

To develop musical expression there should be singing and dancing. Children love to sing, and there are many attractive songs, simple, easy, and not too emotional, to satisfy this desire. They should also make little songs of their own, both the words and the music. The singing should always be sweet, soft, clear, full of expression; never noisy. A piano accompaniment, discreetly played, will usually add to the effectiveness.

Children also love dancing, marching, and other rhythmic action and should be allowed to interpret music freely in dance (p. 178), rhythm, or pantomime (p. 177) as they will. Folk dancing and organized rhythm is also used. Both the piano and the phonograph provide satisfactory accompaniments — the phonograph being best as a rule. Much beautiful music, rhythmic and melodious, is now available in both books and records, and over the school radio.

The school band is an interesting musical activity, and the

plan is rapidly making headway in the elementary school. In the lower grades the grade teacher can handle this; in the upper grades, a special teacher is needed. Fascinating work in creative music is now being done where the children make their own instruments as well as compose their own music.

In the interests of developing appreciation and good taste children should learn to listen to the great singers and players and to know and enjoy the masterpieces of the past as well as the best of modern music. When good music is being played, whether on the phonograph or on the piano, the children should really listen. They must be comfortable and quiet before the music begins. Long selections are to be avoided, especially for the younger ones, who tire quickly. The name of each selection, with the name of the author, may well be given. Recognition, however, is not to be confused with appreciation of the music. If the teacher is a musician some simple explanation of the music after the children are familiar with it — never at first — may be given.

HELPFUL REFERENCES Books and pamphlets which give helpful information and advice will be found in the Appendix.

EQUIPMENT; MATERIALS The equipment for school education in music is no longer a problem, except in regard to cost. The possession of a few simple instruments will bring all the beautiful music of the great artists. Our choice of these instruments depends upon conditions, but it would seem that a phonograph is a necessity, with a piano a close second. These instruments provide for both expression and impression. Having them means, of course, having also records, instrumental music, and song books. These are listed as: I. INSTRUMENTS. II. MUSIC.

I. INSTRUMENTS

a. Phonograph

A phonograph is used for dancing, games, exercises in rhythm and other exercises, and is an important factor in training taste and appreciation in music. Any good make is acceptable. Owing to the rapid changes, no recommendations can be offered. Prices vary from $25 to $250. Terms and discounts are allowed by most makers. Full suggestions for use are given with each machine.

b. Piano

A small movable piano is strongly recommended by music supervisors for general use in the average school. It can be used in the auditorium and classrooms, out-of-doors, or anywhere else, for it is light, has large castors, and can be easily moved by two children or lifted by two men without being harmed. There is sufficient volume of sound for all school use; and since the instrument is low the teacher can look directly over the top at the children, which is a great advantage. The *Miessner* little piano is recommended. The cost is about $270, cash, for schools, f.o.b. at the factory or the local piano dealer's; for a higher price it will be delivered at the house and tuned, and a bench will be supplied. Investigate and order from the cheapest source. Send for descriptive catalogue. If two pianos can be had, a good upright is also advised for the auditorium.

c. Band Instruments

1. *Primary Band Instruments*

The younger children (Grades I–III) get valuable training in rhythm through using these instruments to accompany piano or victrola music. They should always be of the percussion type and should be used for rhythm and time only — never for melody.

It is well to remember that a large group makes noise, not music, and therefore a small band of not more than twelve children is best. Also that only simple, good music with well-defined and even rhythm should be selected.

The following list is suggested from the Carl Fischer Musical Supply: 2 to 4 Bells, each 10 cents; 2 to 4 Clappers, each 5 cents; 2 Triangles, each 40 cents; 2 Cymbals (7-inch), pair $1.25; 1 Metallophone, 95 cents; 2 Tambourines (7-inch), each 60 cents; 1 Hand Stick (7-inch), 35 cents; 1 Drum (Boy's, 10-inch), $1.75.

2. Junior Band Instruments

These are real instruments, mostly of the string type, used with the piano. Any good house—Schirmer, Educational Music Bureau, the Ditson Music Co., J. Fischer, the Boston Music Co.—will aid in selection.

d. Radio Outfits

The radio has only begun to develop. It has tremendous possibilities for school use. Owing to the rapid improvements and changes in the invention no recommendations can be made.

e. Constructed Instruments

Most interesting musical instruments can be made by the children themselves. For full discussion see *Creative Music* (Satis Coleman), and *Creative Music for Schools* (Coleman), a series of inexpensive booklets published by the Lincoln School of Teachers College of Columbia University.

f. Pitch Pipe

A pitch pipe for the teacher's use in leading singing is sometimes needed. This can be had from any music supply firm at a small cost.

II. MUSIC

Lists of music of all kinds, sheet, book, phonograph records, for singing, rhythm, appreciation, and other needs, are so fully worked out in *A Handbook of School Music*, by Cundiff and Dykema of Columbia University, that no further recommendations need be made here.

Lists of phonograph records for schools can also be had from all the reliable firms making phonographs; from state departments of education; and from music departments of universities and colleges.

C. PLAY

MEANING Play is fundamental in education as well as in life, and the school which serves the real needs of children must surely realize this fact, and in some measure utilize it.

The difficulty is largely a matter of understanding just what play really does, or does not, mean to children. Certainly it does not mean merely amusement. Neither does it mean competitive athletics, nor tests in ability to run, jump, or climb. Most emphatically it does not mean learning history lessons, number combinations, phonetics, and primary reading through silly made-up games. In fact, the so-called play method of the primary grades and the habit of dramatizing indiscriminately all sorts of trivial episodes is greatly to be deplored, since it interferes with the wider use of really educative play.

On the other hand, play is the child's serious business in life, his natural way of growing and learning. What it does mean for him is vigorous, thoroughgoing activity that calls for an alert body and a creative mind.

Through play a child creates from within, and thus expresses his own vital interests in his own way. Furthermore, as he plays out the activities of others he broadens his experience and understanding, and thus recreates for himself the world outside. Physical growth and control, poise, and such social qualities as ability to get on with others and ability to see his own power and limits, as well as many by-products, may also come through the give and take of his play activities.

KINDS; METHODS

Now, children play in many ways. Physical activity, dramatic expression, and games of various kinds all have a place in their interest, and each serves some special need. Play activities, like all others, pass quickly from one phase to another. For example, mere physical play does not long remain separate from dramatic play. The boy on the trapeze or ladder is an acrobat or a brave fireman, a child on the seesaw rides a horse, another on the balance board walks a bridge. Again,

certain organized games like "The king in his castle" and "Here we go round the mulberry bush" have a strong dramatic side. For convenience, however, the following divisions are used.

First: *Physical Activities.* Here the pleasure is in the activity itself. Children like to run, jump, swing, slide, climb; there is a sense of power, exhilaration, and bodily freedom in doing these things. Incidentally the physically active child gains through them, also, normal growth, poise, and coördination of muscles and mind. This phase of play is recognized in active play in the gymnasium and in playground work and needs no further notice here, though perhaps it might be suggested that all children in the elementary school need frequent periods of vigorous activity.

Second: *Dramatic Activities.* This term covers a wide field and many forms of expression. It includes, for school needs, spontaneous dramatization of all sorts and various kinds of organized plays. Spoken drama, pantomime, pageantry, dancing, and puppet play are all used freely as each serves best the purpose in mind.

Here the child finds a happy medium through which he expresses his own inner life, and also, putting himself into the lives and work of others, learns how they feel, think, and act. In all this work it is most interesting to watch the changes, both in methods and materials, which come as the children grow older and add to their stock of experiences.

The *free, spontaneous* types of *dramatic activity* are of great value all through the elementary school. The children play out their experiences, their interests, the everyday activities going on around them, and certain phases of their school work. No attempt is made to perfect these dramatizations. They are only for the moment; their value lies

PLATE XIII. UNDIRECTED PLAY ACTIVITIES

An interesting kindergarten environment with well-chosen play materials. The Training School, Western Kentucky (Bowling Green) State Normal College

PLATE XIV. BUILDING ACTIVITIES

Kindergarten children in the School of Education, University of Chicago, using wooden boxes and fruit crates as building materials
(Courtesy of the Laboratory schools of the University of Chicago)

chiefly in the freedom and vigor with which the children express themselves.

At first this play consists of very simple activities with no organization and with quick changes. Little or nothing is needed to help out. Any box is a train, a wagon, and a car in quick succession; a rolled-up towel is a satisfactory baby. But by the kindergarten period a baby doll is preferred to the towel, a doll's bed to an empty box, and playthings which represent real things are eagerly chosen. Gradually the disconnected play of "being the ice man," "talking over the 'phone," "being mamma," shade into playing house or store and imitating other sustained activities. This later playing is organized and quite realistic in the primary grades, and more material is needed to help out the imaginative play. A "play" store must now have bags, boxes, counters, a cash register, and other regulation stock.

Detail and conformity to fact become definitely marked in the upper grades as the children quickly act out certain points or phases of history, geography, literature or industrial life that have caught their attention — as the story of William Tell, trip to Holland, a guild of the Middle Ages.

The words *free* and *spontaneous* describe the method of all this type of play. With the younger children the teacher sees that the essential needs are provided; that each has a fair chance; that there is no danger of chaos; that done, she keeps hands off, leaving them free to play in their own way. The older children need some help in selecting the topic, but otherwise they also should be left free to develop things as they choose.

The desire to make things for use in play (see Construction Activities, p. 53) increases rapidly after the kindergarten period. Playing store in the second grade is much more fun when cartons are collected, clay vegetables made, other things for "sale" constructed, and signs and

labels printed — than when these articles are provided ready-made. The older children usually feel even more strongly about this than those younger.

The *organized dramatic activity* is a rather different matter. This has a definite plot, plan, and action, and is worked out with more care. It begins, like the other kind, in a spontaneous way (the children freely act out bits of stories or rhymes in the kindergarten and the first grade), but quickly passes into the real dramatic form with literary quality of language and thought kept in mind. With the older children these plays require simple settings and at least a few costumes to make the illusion satisfactory; but the younger are content to use almost anything which in the least suggests the thing represented.

Children should make up their own plays, basing them on their experiences, on stories, or on historical facts (see English Activities, p. 138), and act out the parts. They also make their own costumes, stage settings and properties as just suggested. In all this work the teacher coöperates with the children, helping them to find things out for themselves when possible, and supplying needed advice, standards, and encouragement.

There are no "stars" in elementary school plays. Casts change; each child has, sooner or later, the chance to be the king or the queen, the hero or the heroine; to feel the thrill of being a brave defender of his country or a fairy princess, as the case may be. The same child should not be featured often, for the play here is for the benefit of the actors, not of the audience. There is no need for polish or finish. A natural and spontaneous production is a sure sign that the play came from the children. It is well for even young children to have, occasionally, the experience of rounding up their work in a completed form. An elaborate, perfect performance by elementary school children, however, means a com-

plete educational failure. The value of this type of work is what the children themselves put into it and all significance ends when the creative work is done. The endless rehearsing needed to perfect a play is wasted time and worse, for it destroys the pleasure and inspiration already gained.

The matter of the audience is important. Though most dramatic play in school is, as just stated, for the benefit of the actors, now and then an audience is needed—and this should be, preferably, another group of children. Parents, however, are sometimes welcome. The danger lies in too much rehearsing and in having an artificial standard for the play.

Pantomime, which all children use naturally in their play, is full of possibilities for elementary school children. They thoroughly enjoy the opportunity of telling stories with gesture, movement, and changing facial expression, and through this kind of play they quickly lose self-consciousness and gain in freedom, flexibility, and poise. Music adds greatly to both the pleasure and the artistic quality of pantomime. Dancing as a form of dramatic play naturally follows; here rhythm is added to pantomime. Beautiful music (p. 169) expressed by children in dancing is a happy thing for both those who dance and those who watch.

The *pageant*, which makes use of pantomime rather than talking, and makes its appeal through color and grouping, is an excellent form for the use of large groups of children in a school festival. A pageant may be the outgrowth of a year's work of the school in some subject, such as geography or history; or it may dramatize a symbolic or imaginary situation.

Another form of dramatic play, quite universal in its appeal, is that with *puppets* or *marionettes*. In its simplest phase this merely uses a series of cut-out figures which will

stand upon a stage made of a paper box (p. 62). The figures are moved by the child while he talks for them. No attempt is made to move the arms, head, or legs individually. First and second grade children can make and use these figures.

For the real puppet of the Punch-and-Judy type, the cloth body is fitted over the fingers of one hand, the top of the index finger representing the head, the thumb and second finger making the arms. Legs need not be provided for, the front of the stage or long garments doing away with that necessity. Third or fourth grade children can work this idea out.

Marionettes are worked with strings. They are much more complicated than puppets, but fifth and sixth grade children can make and manage them. *Tony Sarg's Marionette Book* gives full directions for making and using these figures.

Third: *Games.* The child in school also plays games with much pleasure. Simple, unorganized games of his own making, then, later, social and competitive games with rules and forfeits are helpful, if wisely used. They aid in developing a sense of fair play, and a willingness to take turns and keep rules; and they aid in making many social adjustments. Folk games, which so often happily supply activity, rhythm, and good fun; singing games, competition games; quiet indoor games, vigorous outdoor games — all have a place. Naturally most of the games at school are played on the grounds during the recess period or at the period allowed for physical exercise. Rhythmic games pass easily into pure rhythm or into musical interpretation p. (169).

At present there is a strong tendency toward too much competition in games and athletics in the elementary school

— the match-game spirit of the college and the high school — and toward neglect of the larger group games (volley ball, town ball), in which many children can play for the fun of playing. Therefore great care is needed here.

SELECTION The wise selection of play material and equipment is most important. There is a happy medium between the too expensive, too extensive equipment of some schools and the barren rooms and playgrounds of others. Over-elaborate toys and pieces of physical apparatus are often seen in kindergartens and primary rooms of progressive schools which are supposed to set a standard for other schools. Many playgrounds specialize entirely in physical apparatus and omit things greatly needed by the younger children (balls, sand piles, blocks, wagons). On the other hand, the poverty of the average primary room is all too familiar. Here children still need a certain amount of play material to stir their imagination and help them interpret or work out the ideas that new and broader experience is sure to bring.

Each school or group selects to suit its own needs. Children from limited homes will need far more playthings than those who already have too many. For these last the cruder, simpler things are best, especially if of their own making.

Watching the children provides many criteria. Much play will go on, granted time and opportunity, with little or no equipment. One object will often serve many needs. A board serves as a seesaw, a horse, a boat, a bridge, a sidewalk, and what not. Substitutes are used where real things are lacking. Boys will play ball with a board for a bat and a string ball and apparently get plenty of fun out of it.

If a child needs something for his play he will probably go to work and make it (p. 53), unless he has been spoiled

by too many ready-made things and has not learned how to work. Nature material is eagerly employed. The children use and discard freely, so much temporary material can be put into service.

HELPFUL REFERENCES Books and pamphlets which give helpful information and advice will be found in the Appendix.

EQUIPMENT AND MATERIALS With all these points in mind, we see that equipment for play will include such things as toys and playthings, building materials, construction materials, some physical apparatus, a few games or equipment for games, and such other things as are needed to help children express their interests and ideas in dramatic play. The contents of the following pages attempt to suggest a sufficient variety in both type and quantity to help teachers who have varied problems. The material is classified as follows: I. Materials for Building Play. II. Toys and Playthings. III. Equipment for Plays and Pageants. IV. Physical Apparatus. V. Miscellaneous Equipment. All prices quoted are approximate. Addresses are listed in the Appendix.

I. MATERIALS FOR BUILDING PLAY

Blocks, sticks, boards, bricks, tiles, and other things for building play are invaluable all through the elementary school. Their permanence and general form make these usable in many situations, especially for dramatic play (play houses, villages, furniture, fences) and for illustrative purposes when used with other material (castle walls, castles, farm houses). While many of the large blocks with rods, girders, or wheels are very expensive, there are so many practical and inexpensive plans for substitutes that no school need be without some form of this material.

Furnished and used by primary children in Buncombe County, North Carolina, Schools

Decorated, furnished, and used by first-grade pupils in Passaic, New Jersey, Public Schools

Used by first-grade children, Springfield, Massachusetts, Public Schools

PLATE XV. PLAYHOUSES

PLATE XVI. MAKING COSTUMES FOR A PLAY

Fifth-grade children, Winnetka, Illinois, Public Schools, make their own costumes for plays and pageants

a. Blocks and Boards

Blocks and boards of all kinds are needed. Large materials are best for the younger children; the older children use both large and small pieces. The collection of blocks should grow steadily. There can scarcely be too many. It will be necessary to have duplicates of sizes that are used often.

1. Blocks may be *purchased* from many sources. For a full discussion see *Permanent Play Materials* (Garrison). Advertising circulars of firms given below will give details. These large blocks are chiefly valuable in kindergartens. Among those highly recommended are, the Broadoak Building Blocks, $60 to $85 (Broadoak Co.); The Hill Kindergarten Floor Block, $100 (Schoenhut Co.); The Trace Blocks, $85 (Milton Bradley Co.); The Sta-Built Blocks (small set), $2.75 up (Embossing Co.); The Builder Boards, $20-$50 (Builder Board Co.); Curved Blocks, for use with any set (Pendelton & Townsend).

2. Blocks may be made locally, at some mill or by a carpenter or a manual training department. Have them smooth and free from splinters. Stain them a soft gray or brown, or leave them plain. Use hard or soft wood, according to the local supply.

(*a*) A set of blocks for forty children, recommended by the School of Education, University of Chicago, is as follows:

20	boards	$1 \times 3 \times 18$ in.	50	blocks	$3 \times 3 \times 12$ in.
50	"	$1 \times 3 \times 24$ in.	100	"	$3 \times 3 \times 6$ in.
25	"	$1 \times 3 \times 30$ in.	150	"	$3 \times 6 \times 12$ in.
25	"	$1 \times 3 \times 36$ in.	25	"	$6 \times 6 \times 6$ in.
15	"	$1 \times 10 \times 72$ in.			

(*b*) Hollow blocks of soft wood, painted green, are used by the City and Country School of New York City (younger kindergarten, nursery groups), in two sizes: $6 \times 12 \times 24$, weight $11\frac{1}{2}$ lb.; $6 \times 12 \times 12$, weight $7\frac{1}{2}$ lb. Two holes are bored in each end of a block to prevent warping. Narrow boards, $\frac{5}{8} \times 3\frac{3}{4} \times 48$ inches to 60 inches, used as accessory material, are painted like blocks.

(*c*) Small cement blocks may be made by the children (p. 69).

3. *Miscellaneous blocks and boards* come from many sources. A box of these, which will also include some spools, round sticks, and other odds and ends, should be in every room, regardless of other building supplies.

(*a*) Old blocks are often contributed from homes.

(*b*) Many blocks and boards can be collected from new houses, saw mills, or shops, free of charge, or purchased by the barrel at small cost. These should be planed and sandpapered, and sometimes cut to uniform measures. Older children can do all this work.

(*c*) Pieces of linoleum, roofing, cardboard, and composition board are all used.

4. *Block substitutes* are quite satisfactory for building play.

(*a*) Empty wooden boxes of varied sizes, with several duplicates of each size, are excellent. They may be painted some bright color with wagon paint for the very young children.

(*b*) Orange crates or other wooden boxes covered with heavy brown paper or gray building paper (suggested by the School of Education, University of Chicago) are highly recommended for first and second grades, and give most interesting results in making playhouses, partitions, stores, and other buildings.

(*c*) Large cardboard cartons in two or three sizes also make good building units for children. The lettering should be covered and the openings closed.

b. Bricks; Tiles; Mosaics

These have many possibilities and some of the material is very beautiful. All kinds, new or old, are acceptable to children.

1. Fancy bricks in soft shades, glazed or unglazed; glazed tiles, in many shades and sizes; small many colored cubes of mosaic — are used for walks, walls, chimneys, houses, and many other purposes. Their beauty and shape, which suggests design, give them, furthermore, distinct art value.

(*a*) Obtain from builders as left-over material or from firms which make fireplaces or floor tiles.

Mosaics also come from toy stores and from the Embossing Company.

(*b*) Have as many as possible — 500 to 1000 pieces of tiles and mosaics of assorted colors, shapes, sizes and 100 to 300 bricks.

2. Ordinary building bricks (new or old) can be used wherever blocks are desired. They are particularly good for outdoor use. Discarded brick from an old wall in a certain city school yard

proved the center of interest all autumn. The younger children outlined houses, built stores, and started group plays much earlier than is usual, while the older children built forts and old castles.

3. Builders' hollow tiles proved suggestive to a group of children working in a sand pile.

c. Miscellaneous Materials

Various materials are as follows:

1. "Stove wood" found much favor in a Southern rural school. The younger children made houses and gardens and fences with it and the older children constructed a realistic log cabin of the early settler type.

2. Old banisters, curtain poles, fence spindles, when sawed into different units, and other round pieces proved suggestive material for small children.

3. Spools, large and small (colored) have many uses in the building play of kindergarten and first-grade children.

II. TOYS AND PLAYTHINGS

Toys and playthings are used a great deal in the kindergarten, and somewhat in the early grades, to help children express their experiences and ideas in dramatic play. Only those which stir the imagination and lead to creative or constructive play should be chosen. Elaborate mechanical toys have no permanent place in the school.

In this connection a number of problems need thoughtful consideration.

First: Most toys should be large, strong, durable, well put together, and made of material which is either washable or can be kept sanitary with fresh paint. Certainly most of them should be attractive in line and color, especially in the kindergarten.

Second: The proper selection of toys and playthings is important. At first completed objects are needed — things

ready, as they are, for play or use. Later children (usually those of the first grade) prefer to make their own equipment as it is needed — for example, a doll bed from a box, or dishes or clay or paper as already mentioned.

The number of toys, even in the kindergarten, should be limited; but that, again, depends largely upon the type of children. When the pupils come from limited homes they will need — sometimes as high as the second grade — to be generously provided for.

Many kinds of play will be encouraged by providing a well-balanced equipment. *Kindergarten* needs are fully covered in *Permanent Play Materials* (Garrison).

The *first grade* needs, as a rule, only a doll, a set of dishes, a few strong pieces of doll furniture, and perhaps some toy animals. A box of small accessory toys will be helpful. The housekeeping things are constantly used, but these come in the general equipment, and are not really play material.

The *second grade* needs practically no real toys, except for foreign or very poor groups. The small accessory toys are often used here in some dramatic play, and the practical housekeeping articles are always essential.

Third: Interesting toys and constructive playthings come from many sources. The Tryon Toy Factory; Samuel Gabriel Sons; Schoenhut Toy Company; Swartz Toy Shop; The Builder Board makers; the toy departments of the John Wanamaker Stores, Marshall Field, Gimbel Brothers, and Macy's have toys of many types. The mail-order houses also have toys. *Best Toys and their Selection* (Leonard) is an excellent guide to sources. Inexpensive and often attractive things are found at holiday seasons everywhere. Suggestions follow. Selections must be made to suit the conditions. Especially important things are starred.

a. Dolls

Dolls are used in playing "house," "mamma," and other family activities for little children, and later they may enter into the more definite dramatization of stories and experiences. Several dolls of varied sizes belong in the kindergarten, and there should be at least one large attractive doll in the first grade. A number of small dolls are used in all lower grades.

1. Among others these purchased dolls are desirable. Investigate prices.

(*a*) The Schoenhut (all wood) dolls are attractive and moderate in price.

(*b*) The Chase Stockinette (all cloth) dolls especially good as baby dolls, are made by the Chase Stockinette Doll Company.

(*c*) The Kathe Kruse doll (cloth), made in peasant and baby doll styles is an artistic, relatively high-priced doll, sold by the Schwartz Toy Store.

(*d*) The Tillicum Tots, small wooden dolls come from H. W. Robinson Company.

(*e*) Small cloth dolls with china heads, for children to dress, can be purchased at a toy shop or at a ten cent store.

(*f*) "Flexy," a wooden doll, inexpensive and attractive, comes from the Flexy Company.

2. Children enjoy making dolls at school for special needs. As a rule these dolls cannot be washed and so must soon be discarded. They are made of cloth, yarn, stockings, gloves, bottles, clothespins, corn husks, and other things, or combinations of such material.

b. Doll Furniture

Doll furniture is often needed to supplement the play with dolls, especially in the kindergarten, and occasionally in the first grade.

Some large pieces with good lines and workmanship, factory-made (from local or city shops), or carpenter-made, should be supplied. Still other pieces may be made by the children.

The following are suggested, the more important ones being starred:

*Bed	Baby Carriage	*Trunk or chest
*Table	*Cupboard	Cradle
*Chairs	Sideboard	Hammock

c. Other Housekeeping Toys

Certain housekeeping toys are desirable. In most cases these should be large enough to be practical. Miniature reproductions are also used with pleasure (see Accessory Playthings).

1. *Cooking Outfit:* *cooking utensils (p. 284), small oven (p. 284), stove (p. 283).

2. *Dishes:* nonbreakable (pewter, tin) for kindergarten; china or school-made (clay, paper cups, and plates, decorated or shellacked) for first and second grades: dish pan and towels; small tray.

3. *Washing Outfit* (p. 265): *washtubs; *washboard, clothes basket; line; *pins.

4. *Ironing Outfit:* *iron; board (see p. 281).

5. *Cleaning Outfit* (see p. 265): *broom; sweeper; *dust pan; *dust cloths.

d. Accessory Playthings

These include many small toys, large toys, and other things which may add to the child's play interest. Great care is needed here, since it is easy to offer an oversupply, and too much realism works against imagination and creative tendencies.

1. Miniature toys are interesting, and help in sand, block, or construction play to supplement larger materials. These come largely from ten cent, candy, and Japanese stores. Miniature dishes, furniture, blocks, animals, dolls, fans, parasols, beads of all sorts, and many other tiny things are desirable. Other toys, such as scales, telephone, cash register, *shopping bag, *suit case, *trains, and motor vehicles add to the possibilities of dramatic play.

2. Much school-made equipment (paper hats and fans, clay vegetables, scales, paper or cloth dresses for dolls, and such articles) is used by primary children for store, market, or other industrial play.

3. *Wagons and *wheelbarrows, large and small, are essential to every school; they have both play and practical values.

4. A *Noah's ark with good-sized animals is always popular in kindergarten and first grade.

5. Nature (p. 87) offers much in the way of play materials: saplings for horses; seed pods for boats; dishes; acorn cups; daisies and clovers for chains; flowers and corn nubbins for dolls; leaves to pin together with sticks for little hats; berries to use for vegetables and fruit; and many other treasures which add greatly to the school equipment both on the making and the playing side.

e. Toy Money

Toy money is popular with all children and has arithmetical (p. 36) as well as play value.

1. A large supply of coins, ranging from one cent to one dollar, and bills of one, two, and five dollars, are needed. The money may be kept in a large box for the use of the group, or each child may have his own box. Partitions for the different denominations will always prove a good plan.

2. The money may be made by the children, of cardboard or of construction paper (milk-bottle tops make good dollars), marked with the stamp outfit and shellacked if for permanent use; or it may be purchased from any school-supply house (1000 pieces for $1). This last is perhaps the best for first and second grades.

3. Toy money is used by little children in play. The children get the money in any amounts decided upon; they must know how much they need and take the exact amount. They use it in any form of dramatic play (store, bank, market). Older children use it for drill material or in preparation for a real sale or other actual experience.

III. EQUIPMENT FOR PLAYS AND PAGEANTS

All school plays, whether those of the free, spontaneous type or those given before an audience, should be kept simple. Only those things really needed to swing the action of the play or add to its effectiveness should be used. Too much realism and too many properties and overelaborate costumes and settings are confusing and also inartistic. They make extra work for teachers and children and slow

up the action of play. As a result, imagination is limited and the illusion is destroyed for audience and players alike.

a. General Plans

Planning, collecting, making and adapting the most of needed equipment should be the children's work, just as composing the play is. Much of the work is done at the time it is needed, but certain equipment is kept in stock.

1. Everyday things should be used when possible for both costumes and properties. This plan simplifies the work and also develops the children's ingenuity and inventiveness.

(*a*) For temporary or spontaneous dramatization, quick transitions are made. A pointer or ruler becomes a king's scepter; a sweater turns a child into a bear; a box is a seat or a throne.

(*b*) For the organized play given before an audience, greater care is needed. Color, grouping, and general effects are much more important here. They are often easily obtained through simple means.

2. Other things must be constructed to meet a special need.

(*a*) Materials and many suggestions for their use will be found in Chapter Three, Constructive Activities. Read all this carefully and thoroughly.

(*b*) Other helps for making dramatic equipment will be found in books listed in Appendix.

3. For accurate and detailed plans for history, geography, or period plays of older children, consult the following sources:

(*a*) The museums (see Appendix) in large cities offer fine opportunities. Some of these send out descriptive leaflets or bulletins.

(*b*) The Child Welfare Association publishes pictures of children from many lands (ten plates, $1), which give correct details of dress and setting.

(*c*) The Playground and Recreation Association of America publishes a number of pageants with descriptive notes about costumes, properties, and settings.

(*d*) Historic Costume Plates: Northrop and Green; Bureau of

PLATE XVII. SIMPLE AND EFFECTIVE BACKGROUND, SETTINGS, AND COSTUMES

A play growing out of spring activities of primary children, Winnetka, Illinois, Public Schools

PLATE XVIII. AN ATTRACTIVE NATURAL SETTING

An Indian play given outdoors by the third grade, Training School, Oswego, New York, Normal School

Publication, Teachers College of Columbia University, are an excellent series of 30 plates (14 historical: 16 national dress of different countries) with sketch, description, notes in color, and a helpful manual.

(*e*) Interpretative Costume Design — Rose Kerr: the Fairbanks Art Company, is a series of 4 folios, each 12 plates, at $1 each folio — Egypt, Greece, Rome; The Orient; The Age of Chivalry; American Costumes, with full descriptions and plates.

b. Costumes

1. Much ordinary clothing will serve costume plans (tights, leggings, caps, boots, capes, hats). This material may be worn in unusual combinations or adapted slightly to suit the need.

2. Costumes may be easily made by the children, even the very little ones, with some help.

(*a*) Pinning things together with safety-pins or tacking them with strong thread is often all that is needed.

(*b*) A set of patterns is most helpful. These patterns will include pajamas, one-piece, with feet (7- and 9-year sizes); smocks (6- to 9-year sizes); cape; costumes of all kinds (10-year size). Cut in duplicate from heavy paper for children's use. Make larger or smaller as desired.

(*c*) Seams are usually raw, run by hand with large stitches, or on machines. Hems and lower edges are also, in most cases, left unfinished.

(*d*) Tucks, temporary hems, and draping will adapt to special needs costumes already made.

(*e*) Decorations cut from wall paper, colored paper, or cretonne are pasted on. Block printing (p. 85) with oil paint in large designs is effective.

(*f*) Shellac (p. 110) applied to fabric or to paper will stiffen the material.

(*g*) Dyeing (p. 79) produces beautiful effects with old and new fabrics.

(*h*) Gesso (p. 108) and glue and whiting mixture (p. 108) give relief work and effects which may be gilded or colored.

3. Certain costumes can be used over and over. Keep these in stock.

(*a*) Loose smocks, kimono style, in tan, green, and bright colors for peasant, page, knights, and other characters.

(*b*) Long stockings of many colors for hose.

(*c*) Tights made of old union suits dyed dark colors.

(*d*) A few capes of bright colors for all sorts of use.

(*e*) Loose, sleeveless dresses hanging straight from the shoulder, of net, cheesecloth, or some other soft material, for dancers and fairies.

(*f*) One-piece pajamas with feet and caps attached, of cambric or cotton flannel, in white, green, or brown, for rabbits, brownies, bears, and other uses.

4. Other things, which may be kept in stock or not, include:

(*a*) Headdresses of flowers, feathers, and paper lace.

(*b*) Crowns of gold and silver, of all sizes and designs.

(*c*) Shields of cardboard or tin (the tops of large tin cans), decorated with paper, paint, gesso, or calcimine.

(*d*) Chain armor made of dishcloths from the ten cent store silvered with radiator paint.

5. *Materials* may be obtained as suggested in Constructive Activities. Wholesale merchants sell such materials as netting and muslin by the piece, and socks and other garments, at low cost.

c. Properties

1. Dolls, a few toys, some models or reproductions (food of clay or papier-mâché, store equipment), made by the children, are used in certain dramatic presentations.

2. Things to carry, such as large bright-colored balloons and balls: paper lanterns on sticks, flags, banners, long-handled fans and plumes, cut-outs of peacocks, birds, or other objects, mounted on sticks, give color and beauty to processions or groups in which many children take part.

d. Furniture and Other Devices

1. Furniture needs are very limited.

(*a*) Chairs or boxes covered with paper or cloth will serve most purposes.

(*b*) Trestle tables (p. 296) are very satisfactory for plays.

(*c*) Floor benches (p. 298) are always usable.

2. Other devices may be made by a carpenter.

(*a*) A rolling platform (p. 194) helps by forming a new level, by accommodating attractive groups, and in other ways.

(*b*) A lattice-work garden gate with a few panels of fencing in correct proportions for children, is often usable in school productions.

e. Settings and Background

These depend upon the type of the play and where it is given.

1. For spontaneous dramatic play or for the average classroom dramatics, only screens are needed.

2. For plays on a stage before an audience there must be a suitable background. It should be quiet and soft in tone — light gray, buff, or gray green — to bring out the brighter colors of the costumes and properties. Drop (back or side) scenery of the realistic type, as of houses, trees, or sky, is not desirable.

(*a*) A straight, soft, heavy curtain makes the most effective background where the back of the stage is not finished in plain lines and good colors.

(*b*) Screens, folding or stationary (pp. 301, 302), are most practical. They should be tall enough to cover objectionable wall features and in sufficient number to satisfy all needs. Properly placed they will also serve as entrances and front curtains (folding). The playhouse screen with door and window is used in primary plays.

The screens may be covered with heavy cloth or paper which is calcimined in any desired color, or with wire fencing filled with greens. One school found lattice screens attractive and useful for plays, and easy to transform with a few vines, a coat of whitewash or other temporary treatment. Both lattice and wire screens may be used out of doors effectively.

3. For *outdoor* plays or *pageants*, see pamphlets of Play Ground Association, also books listed in the Appendix.

f. Lighting

This is fully discussed in the books and pamphlets mentioned.

g. Published Plays and Pageants

Published books of plays are not advised. Elementary school children should make up their own plays (see English Activities, p. 138) and pageants, using experiences, stories, or creative plots. Published material offers guidance and suggestions but should not be used verbatim except in rare cases. The Francis Parker School of Chicago has a number of short plays worked out by the children (some with descriptive notes). Price, a few cents each.

h. Plays with Marionettes and Puppets

Directions for making puppets and marionettes, and all necessary details and equipment, are given in *Tony Sarg's Marionette Book*, and in *The Land of Punch and Judy*.

i. Storage Equipment

1. A box on castors (see Movable Boxes, p. 334) will take care of stock costumes belonging to the school, materials for draperies, curtains, and small properties (swords, wands, crowns) which may be needed in other plays or entertainments. In this way much time, money, and effort are saved.

(*a*) This box may be kept in the hall and rolled into any room where the children are planning a play and wish to look over the contents and select the things that they need.

(*b*) The box is in charge of a committee of older children which keeps the key, makes note of each group or child who opens the box, and sees that the contents are kept in order and that all borrowed costumes are returned.

2. Other plans, pp. 326–339, also p. 77.

IV. PHYSICAL APPARATUS

This includes the equipment which stimulates the child to vigorous bodily activity indoors (classroom and gymnasium) and out-of-doors (playground). There is special need for some apparatus in the kindergarten and primary classrooms, where frequent periods of bodily activity are needed and where the children are often kept indoors by weather conditions.

A few strong pieces — a climbing rope, a bar, one wide board for use as a seesaw and a joggling board, a narrow beam for balance; and perhaps a slide (kindergarten), all locally made, are advised, and a piece of climbing apparatus called the "jungle gym, jr.' ($40), highly recommended by progressive schools, seems worth having.

This phase has been so well covered that no further discussion is attempted here. The following sources are adequate:

A Catalog of Play Equipment, Hunt (35 cents), gives full specifications for indoor and outdoor apparatus for small children.

Permanent Play Materials, Garrison ($1.25), describe more elaborate equipment for kindergarten and first grade.

Pamphlets (5–25 cents) of the Playground Association of America; *Back Yard Playgrounds* (free), Children's Bureau, United States Department of Labor; *Rural School Playgrounds* (free), Bureau of Education, give plans, specifications, essentials, and other information about gymnasium and playground apparatus.

V. MISCELLANEOUS EQUIPMENT

a. Sand Box

Equipment for sand play has a recognized place, both indoors and out-of-doors. The old-type sand table is, however, out of date. The sand box is best for young children. Any ordinary table or a board (p. 117), with sawdust (p. 109), or paper pulp (p. 103), or paper used instead of sand for a base, will serve for illustration work in the upper grades.

Sand is used largely for undirected play in kindergarten and lower grades. Little children like to feel it slipping through their fingers. They like to dig and pat and shape wet sand and make it into pies and cakes and ice-cream cones. They make caves, ditches, wells, yards, and tunnels around which, with the addition of some accessory playthings, they gradually build fine dramatic plays.

1. An out-of-doors pit or box of sand or screened gravel provides a favorite spot for children of all ages. Have it as large as possible (12 × 15 feet minimum; 12 × 30 feet desired). Place it in a sheltered place in the school yard, or on the porch or the roof, as conditions require. Build the box or casing of good, planed lumber (no floor), about 14–18 inches high. Fill it nearly to the top with sand; have a pile toward the center. A seat about 12 inches wide is often built around the edge. A strong box with padlock and key, to hold sand toys and other things, is essential. A sand pile or a screened gravel pile is also good and is often used on playgrounds which are not too crowded.

2. An indoor sand box, zinc-lined, constructed as above or let into the floor, is needed for the kindergarten and is excellent for first grade. Size and placing depend upon available space. Incurving sides at the top, to keep the sand from the floor, and drop seats hinged on to the box around the edges are good. A cover is desired.

3. Accessory materials used in sand play include bricks, blocks, tiles, and small toys (cart, animals, dolls). Large wooden spoons and hearth shovels from the ten cent stores, pails, pans for sand pies, cooking utensils, cooky cutters (fancy shapes) shells, pebbles, and other odds and ends brought by children are desirable. Small cement blocks and figures of animals and people may be easily made (p. 69).

b. Movable Platform

A small platform (4 × 6, 6 × 10, 10 × 12 feet or any other size), from 12 to 14 inches high, of strong construction but as light in weight as possible, mounted on heavy castors, served many play needs. It is used for floor play with blocks or toys, for spontaneous dramatic play, on the stage (p. 191) where different levels are needed to give the best effects, and for outdoor plays. The castors may be omitted. Keep the platform on end, leaning against the wall when it is not in use.

c. Play Screens

Low collapsible screens, 36 × 42 or 24 × 36 feet, made of lattice work or wall board (p. 77), are used in the nursery and kindergarten, and occasionally in the first grade, for marking off block boundaries and making enclosures for many types of play.

d. Playhouse Screens

A screen of two, three, or more panels, with a door and a window hinged on, is almost an essential in primary rooms. These screens may be folded when not in use. Dimensions and plans vary. The following are offered:

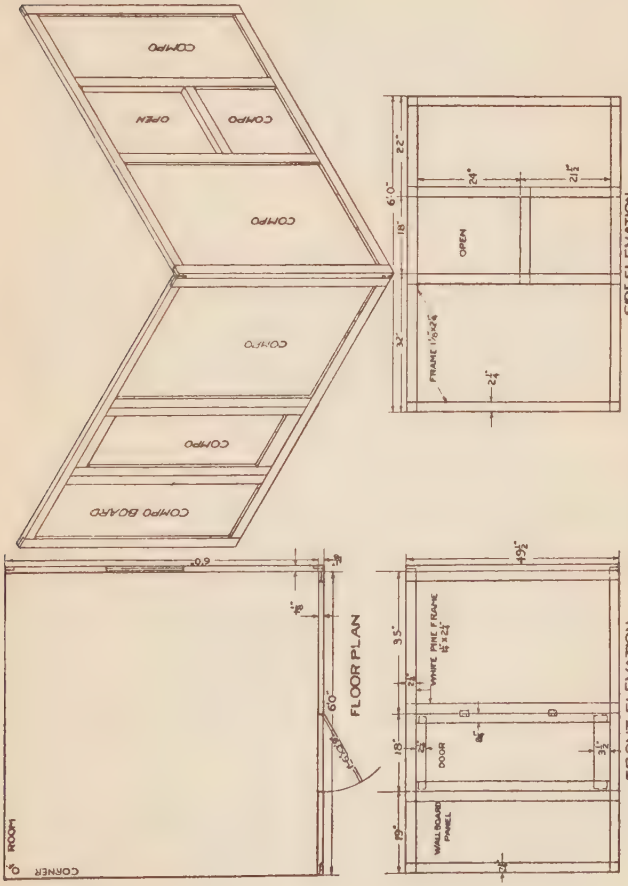


Fig. 4. Working Drawing of Playhouse Screen

Designed and used in Passaic, New Jersey, Public Schools. The space enclosed may also be used for a reading corner. (Courtesy of Passaic, New Jersey, Vocational School.)

1. The public schools of Passaic, N.J., use a large two-panel screen (6 feet wide, 5 feet high) placed in the corner of the room and fastened by large, strong hooks to the walls, which form two sides of the playhouse. One panel has a door hinged on, and the other has an open space for a window. This forms a most attractive place, quite large enough for real play and furniture, and is strongly recommended. If there are fixed desks, remove two or three to make room for the screen, which may go on the window side.

2. Other playhouse screens stand alone and have from three to five parts. The University (of Chicago) Elementary School suggests a 5-part screen in which the middle division contains the door. This is five and a half feet high; the other four parts are five feet high. All divisions are thirty-two and a half inches wide. One or more windows may be used.

e. Play Houses

Outdoor playhouses for primary children are used by many schools. These are large enough for one or more children to work inside. Very large packing boxes; wood frame work covered with roofing, wall board or burlap sacking; and other plans are used. These houses are more or less permanent. The Playground Association has some good suggestions for small buildings.

f. Equipment for Water Play

1. A place for sailing boats or floating toys is desirable in kindergarten and primary rooms. Some schools have cement tanks, but this is not a practical plan for all, because it requires floor draining. Miss Garrison in *Permanent Play Materials* suggests a galvanized iron tub, painted (automobile paint) attractively on the outside, as a most satisfactory and practical plan, since the tub may also be used for other purposes (pp. 18, 265) and is easily stored when not in use.

(*a*) Boats of paper shellacked (p. 110) or dipped in paraffin, or boats of wood, can be made by the children. Boats can also be purchased from toy stores.

(*b*) Floating toys can also be made or purchased from ten cent or Japanese stores — celluloid animals, sponge dolls or ducks, paper flowers which unfold in water, and other small objects.

2. Soap-bubble pipes (if they can be sterilized) from ten cent

stores are good. Soap flakes or white soap and small basins (p. 265) will be needed also.

VI. GAMES

Games of various kinds are practical in all grades. Many games are inexpensive (Samuel Gabriel Sons, ten cent stores, and other toy stores supply these) or are made by children. Many involve number experiences and thus arithmetic drill is given as a by-product.

a. Active Games

1. For outdoor or informal indoor group play — marbles, tenpins, quoits, bean bags, tops, soap-bubble pipes, are all good.

(*a*) Bean bags: Small bags or larger ones in oblong, round, or animal (for small children) shapes, are half filled with beans, small gravel, or sand to give them weight. Separate covers with snap fasteners are used.

(*b*) Ring toss: Rings are made of wire, reed, or hoops. A stick (broomstick two feet long, nailed on a flat, heavy board about twelve inches square) is used to catch rings.

(*c*) Other games are added by the teacher.

2. Balls of all sizes and types are essential in all grades, for rhythmic play, score games, and individual play.

(*a*) Two to six large (six- to eight-inch) rubber balls (from Miller Rubber Co., Milton Bradley, or rubber-tire firms) are needed in kindergarten and first grade.

(*b*) Tennis balls and other soft rubber balls, as many as can be afforded, are desired in all grades.

(*c*) A leather (eight to twelve-inch) ball (volley, basket, foot) is desired for all grades. These balls come from any athletic dealer or mail-order firm.

(*d*) A wooden ball is needed for ninepins. An old croquet ball will serve.

3. Field and playground games (such as baseball and volley ball) are fully covered in pamphlets issued by the Playground and Recreation Association of America, or by commercial firms that deal in such apparatus.

b. Quiet Games

Dominoes, parchesi, lotto, fish-pond, jackstraws, sliced animals, pictures, maps, number puzzles, and other games may be purchased from any toy store or ten cent store, or given by children, or by parents whose children have grown up. There are printed rules to follow. These games are often helpful in teaching number and are of special value in overcrowded rooms.

CHAPTER SIX

SUPPLEMENTARY ACTIVITIES AND MATERIALS

LIBRARY, MUSEUM, PICTURES, EXHIBITS

A. THE SCHOOL LIBRARY

BOOKS

VALUES As has been said so often, books are no substitute for real experiences, but it may also be said with equal truth that there are no substitutes for books. A child's knowledge and imagination are both limited, and if there is nothing to supplement and develop his experiences, his interest soon dies out and his initiative goes. Experiences are essential. Pictures and objects do much; but after all, sooner or later we must turn to books for help.

The trouble with the schools has been that they have done this turning to books sooner rather than later — before the children have had time to gather up the first-hand experiences that are worth while. In short, they have reversed the natural order and given the second-hand experiences first. It's a bit like Alice in *Through the Looking Glass*, when she saw the blood and felt the pain *before* she pricked her finger. But granted the proper basis of understanding, and the right kinds of reading matter and its proper use, there is no greater factor in a child's school life than books.

On the practical side, there is the supplying of often-needed information. To understand fully his own life and environment, the child of to-day must know something of yesterday, of the people who worked, achieved, and passed on, of the slow changes and new ideas which made the present what it is. For every activity and fact of modern life has

its roots in the past. Along with this he must have some knowledge of science and processes, of short cuts and details which are needed in his own everyday life and work. Moreover, if the child is to have social understanding, he must realize that people and countries very different from his own exist, and he must know something about them. These various kinds of knowledge he receives from books.

Nor is this all. Into books have gone not only the records of concrete facts and definite realities which we may call information, but also the hopes and beliefs, dreams and inspirations of the thinkers and singers of the world. These, indeed, form a mighty gift of beauty and joy for even the youngest of our children, while to know and to love some of the fine things in literature is to find also a wider vision and higher ideals in life itself.

PURPOSE; CONTENTS The school library, like the school museum, must meet many needs, including those of both teachers and children. Its purpose is to provide a well-chosen collection of books that are suited in style, vocabulary, and subject-matter to the children who are to use them; sufficiently varied in material and content to offer all types of reading; attractive, hygienic in makeup, and strong in construction. Here, then, should be found books which give needed facts of all kinds. Here also should be books which stir to action by telling of great deeds and mighty men of all times; books which thrill by their beauty of thought and word, books which brush away cobwebs and wake up sleepy brains. Magazines and papers are also needed.

PLANS There are two distinct plans for the school collection of books. First — and here is the ideal toward which every school should work — there is the

PLATE XIX. A SCHOOL LIBRARY

The Coventry Elementary School, Cleveland, Ohio, Public Schools, has a well-equipped library with a librarian in charge
(Courtesy of the Library Bureau)

PLATE XX. AN EXAMPLE OF COÖPERATION

A children's librarian comes from a public library to this school on certain days to distribute books for home use and give needed aid to the teachers. (Courtesy of the Chicago Public Library)

central library, properly equipped and administered. Nothing in the school life is more fruitful of result than a quiet, attractive, well-lighted room, full of well-chosen books within easy reach, with comfortable chairs, low tables, interesting pictures, bulletin boards — above all, with a sympathetic, interested librarian in charge. The advantages seem obvious. The same books may serve many children, and much expensive duplication of the same books in different classrooms thus be avoided. Reference work is made much easier, for time is saved and interest conserved when the required book is easily accessible; also there is rapid growth in the children's ability to use books independently. The library habit, a great asset, is established early. Concentration, quiet thinking and relaxed nerves are not the least of the benefits of the central library plan. The librarian soon pays for herself through her value to both children and classroom teachers. She will give help as needed in finding books and materials, in offering suggestions for self-help, or in making a quick response to a child's joy in discovering a new treasure or an old, loved story. Indeed in the large elementary school of the future she will be as necessary a member of the staff as the primary teacher or the school nurse.

The second plan is the *classroom library*, where the books are divided and each group keeps those which they use most constantly. This is the usual method in most schools, and while it fails to give the larger training of the central library, much may be done by the intelligent classroom teacher in developing reference work and independent reading. Just here it seems well to note that the first and second grades should have a small personal collection of intimate books regardless of whether or not there is a central library, since the reading needs of younger children require close contact and familiarity with certain books. These,

however, supplement, and do not substitute for, the larger collections.

Naturally, in working toward the higher standard, there must needs be transition plans, and local conditions vary so greatly that each school must find its own solution of the problem. Further discussion of some of these points follows presently in Special Problems.

SELECTION OF BOOKS Hundreds of charming, interesting, and well-written books for children are now available. Only the careless or indifferent teacher will allow any but really good books to fall into the hands of the children. Fundamental principles are discussed in English activities (pp. 132–145) and elsewhere in this chapter (pp. 205–210). With these principles in mind the following practical points are suggested to aid in selecting books.

It should always be kept in mind that school collections must meet definite curricular requirements, that the reading time of the children is limited, as is also the money to be spent, and that storage, care, and distribution must be considered. This means fewer books, stronger and more practical books, and, in many cases cheaper books. Many interesting or delicately bound and beautifully made books which are most desirable for children's reading and for public and private collections must be omitted.

Individual books are better than sets of books except in the case of a good encyclopedia. Sets of books are expensive, too bulky for children to handle, too condensed as to material, and often poorly written and edited.

A limited number of books on a given topic is best. Elementary children are confused by too large a selection of books and waste time and effort in aimless hunting. It is usually better to select from two to four good books and then have duplicate copies of them; for example, two or three

different books on Indians, with two copies of each, rather than six Indian books of entirely different content, unless all are especially good.

Primary books are often excellent for all the children as reference material, for example, *Viking Tales* (Hall) and *Childhood of Ji-Shib* (Jenks).

There are also now on the market many small books in cloth or paper covers (p. 211), chiefly reprints of old classics, or dealing with industrial materials (cotton, flax), which are excellent: since the cost is only a few cents each, they can be discarded when soiled or worn. Attention should be paid to both makeup and content, since much poor material is found along with the good.

In considering the physical makeup of books for the school library there are several characteristics to be noted. The print (type) should be clear, large and well-spaced; the paper, of dull finish, opaque, and a suitable white. These points are most important, since poor, small print and glazed or indifferent paper may cause serious damage to children's eyes.

Books should in general be strong and well-bound, with serviceable covers. The delicately bound editions in soft colors that are so lovely at first soon become, with handling, most unbeautiful and are quickly worn out, and while it is desirable to keep some of these beautiful books in reserve, the plainer type should distinctly predominate. Nearly all the good books for children come in a number of editions, and so it pays to look over the lists of several publishers.

Correct English, literary quality, suitable and interesting style (see English Activities, pp. 133, 134) are greatly to be desired in all books for children. Other needs, such as accuracy and organization, will be discussed presently.

Good illustrations add greatly to the value of books. In books designed to give information they are a necessity.

Much beautiful work in illustrating is now being done by such artists as Crane, Brooke, Caldecott, Boutet de Monvel, Rackam, LeMair, Pyle, Jessie Wilcox Smith, Maxfield Parrish, Tony Sarg, and others. (See Picture Books, p. 210.)

All books should be selected by the school principal or supervisor from lists submitted by the teachers. Classified lists of children's books found in library lists, publishers' catalogues, many courses of study, and books on story telling (see Appendix), will be of aid in making these lists for the individual school. Those issued by the American Library Association and by the children's departments of large public libraries are best, since they are kept up to date. *Children's Reading* (Terman and Lima) also has excellent lists. Since the reading ability of children of the same age and grade differs greatly in different schools and sections, it is unwise to use, without some revision, any list made for a definite group.

HELPFUL REFERENCES Books and pamphlets which will aid teachers and others are listed in the Appendix.

MATERIALS; EQUIPMENTS The needs of the library include books, papers, magazines, and other printed materials, and also the equipment for caring for this material. All prices quoted are approximate. All addresses are listed in the Appendix. The following suggestions are offered, which include: I. Kinds and Qualities of Books. II. Sources of Books. III. Special Problems.

I. KINDS AND QUALITIES OF BOOKS

In general the books fall into two groups, the Literature group, which has beauty as its end and aim, and the Information group, which gives facts. These books differ in style

and method as well as in purpose. Sometimes, and it is pleasant to state, more and more frequently we find books which combine accuracy as to facts with delightful literary quality. Jennie Hall's *Viking Tales* and *Buried Cities*, Van Loon's *Story of Mankind* and Edith Patch's *Hexapod Stories* are of this type.

a. The Information Group

Books that give interesting and accurate information of all sorts are essential. These books answer the children's questions, increase their knowledge, and tell them the best ways of doing many things. They also add to, and extend, the knowledge that children obtain through actual doing, seeing, and hearing, and should lead to further study and work. Children soon learn to respect facts and to appreciate accuracy of statement; and they readily turn from truth in reality to truth in books. If they once feel the thrilling interest of real happenings and then find them recorded, there will be no abnormal craving for a "story" that will sugar-coat something which is in itself more interesting than any story. Many good lists of such books are now available. A bibliography will be found in the Appendix.

1. *Health, Science, Nature Books*

These books should be accurate and absolutely true to fact — no other kind should be allowed in this class. Better no science in the school library than pseudo or false science. If the scientific material is wisely chosen and is told in a simple, clear-cut, direct way, it will be interesting. The facts of nature, and man's use of nature's laws and products are so wonderful that they need no dressing up. The employment of the story form in this type of book is usually bad, even for the little children, for as has just been said, the less there is to distract from the central theme, the better.

For primary children, the simple naming of an insect, bird, or beast (as Van the Butterfly in *Hexapod Stories*, or White Patch, the Ant in *The Story of White Patch*) is not objectionable.

As has just been said, the whole aim of science is truth and accuracy; neither of these qualities is to be found in fanciful tales about little-girl waterdrops (*Aqua, the Water Drop*), the "giant" (steam) which turns mill wheels, the "Health Fairy," "Tony Turnip," and all the many absurdities which so clutter up the so-

called science books, especially those for little children. Giving a young child clear ideas is difficult enough anyway, but when the teacher deliberately muddles the situation by making fairies and giants and people out of steam, electricity, wind, and other great natural forces, it is no wonder the child becomes confused and gets his head full of fantastic notions and half truths. How can he possibly think clearly and judge wisely with such mental furnishing?

Of course the old nature tales (*Echo and Narcissus*, *Clyte*, *Arachne*, *Balder*) are different. Here we have the sincere explanations by a long ago people of happenings for which they could find no natural explanation. This type of story is often beautiful and poetic. To-day we use the tales as literature but *never* as a statement of facts.

There are some excellent books and many, many poor ones bearing the scientific label. Names of writers furnish the surest guidance for selection. Teachers should be familiar with the work of Edith Patch, Fabre (the great French scientist), Enos Mills, David Starr Jordan, John Muir, Vernon Kellogg, Hawksworth, Beebe, Scoville, Chapman, and Agassiz, who speak with authority in their special fields. Cobb and Gulick are recognized as experts in Health and Hygiene. New writers are also appearing.

2. *History, Geography Books*

The books of this type differ somewhat from the science books. Truth is required from these, too, but in some cases it is truth of the spirit rather than fact — always excepting certain geographical books. Minor inaccuracies do not count so much if the larger statements are correct. Stories, if realistically told, are permissible — often most desirable. A period in history, a country, a manner of living — especially if far removed from the child's own life and experience — frequently seems much more real when it serves as a background for a series of events, provided the events are not too dramatic. Stories of the Middle Ages give the children unforgettable contact with the people, customs, and life of that day. Robin Hood in the greenwood offers a good picture of rural England in the tenth century. *Master Skylark* (Bennet) is an interesting story of Elizabethan days; *Men of Iron* and *Otto of the Silver Hand* (Pyle) and *Gabriel and the Hour Book* (Stein) tell of the Middle Ages. *Two Little Confederates* (Page), *Diddie Dumps and Tot* (Pyrnell), and other books give vivid pictures of certain conditions and periods.

Authentic accounts, however, are usually to be preferred. The lives of interesting persons, travel records, and descriptions of countries, people, and industries are distinctly interesting and need no plot or retouching. The school library eagerly reaches out for books and yet more books of this type. Many of them are as interesting to adults as to children, *The Story of Mankind* (Van Loon), *The Days of the Guild* (Lamprey), *How the Present Came from the Past* (Wells), are but a few of this type.

3. *Reference and General Information Books*

These books depend for their value upon their accuracy, fullness, and organization. A satisfactory dictionary is necessary; every school library needs an adequate children's encyclopedia. Good ones, however, are expensive, and cheap ones usually poor, so it is wisest to wait till the school finances allow the best. Any recommendation is quickly out of date. When ready to purchase, it is well to ask advice from one of the progressive schools or public libraries since at any time better books may be issued than those in mind.

Reference books on special subjects are added when possible, and a good set of geographical readers is essential.

b. The Literature Group

Many books for the children's reading are chosen because they are real literature. These include story books (fanciful and realistic) poetry, essay, and biography. As elsewhere suggested, they should balance the informative books. Here the story is in its own field, and for value it has no close second. *Literature in the Elementary School* (McClintock) gives an excellent presentation of this topic. So much work has been done in this field and such excellent classified lists (see Appendix for bibliography) are available that only a few suggestions follow:

1. *Story Books*

Of course there are all kinds of stories: the fairy or folk tale, old and new; animal tales; myths; legends, hero tales; and realistic stories which have no magic or supernatural element, but which might have been true. Each kind has its place in the child's reading experiences.

The young child should have his books of fairy and folk tales, but not too many of them, nor should those that he does receive

contain an overdose of magic, only magic enough to move the story. The old folk tales are best; they are closer to the little child's experiences and, since they were told to and by a people who really believed them, are more sincere. Of these Grimm's *Household Tales*, Perrault's *Tales of Mother Goose*, the Norse tales collected by Mrs. Thomsen in *East o' the Sun, West o' the Moon*, and a few old English fairy tales in O'Shea's *Six Nursery Classics*, for primary children, and *Arabian Nights* for the older ones, are adequate. There are many editions of these tales in all prices, and many are reproduced in the primers and readers, so this type of reading material presents no problem to the teacher.

The great hero tales about Sigurd, Cuchulain, Beowulf, Arthur, Odysseus (Ulysses), Kalevela, Roland, and others, are the natural heritage and joy of the nine- to twelve-year-olds and should always form a part of their reading. The stories also are found in expensive and inexpensive editions.

The myth belongs especially in the upper grades. Its symbolism and complexity are unsuited to the younger children, who need directness and simplicity in all their reading material. The more modern fairy tale is often artificial, made-up and overstimulating, so great care in selection is needed. There are, however, some lovely things which may well belong in a child's literary experience. Most of these are for children between eight and eleven. *Honey Bee* (Anatole France), some of Frank Stockton's *Fanciful Tales*, *The Little Lame Prince* (Mulock), Andersen's *Fairy Tales*, *The Wonderful Adventures of Nils* (Lagerlöf), and perhaps a few others may be chosen. Modern animal tales are also included here. Among these, Kipling's *Jungle Book*, *The Wind in the Willows* (Grahame), *The Story of Dr. Dolittle* (Lofting) and Harris's *Uncle Remus* stories stand out in strong relief.

On the other hand, children of all ages need many well-told. realistic stories of other children and their experiences such as *Heidi* (Spyri), *What Happened to Inger Johanne* (Zwilgemeyer), *The Birch and the Star* (Thomsen), *The Cart of Many Colors* (Meiklejohn); also stories about people and countries as suggested under History and Geography Books.

2. *Books of Description; Essay; Travel*

This type of writing is for the older children, and is oftenest found in biography, in magazines, and in adult travel books. Recently, however, books of this kind, written for children have be-

gun to appear. Young David Putnam's story of the Arcturus is one of these, and others will follow. Essays may be cut from the magazines and bound into booklets (pp. 147, 152). Selections from biographies and letters may be made. Certain portions from recent biographies and letters — those of Robert Louis Stevenson, Richard Harding Davis and others — could be chosen. Kate Douglas Wiggin's *My Garden of Memory* contains some lovely bits of her childhood which would make distinct appeal — especially the experience with Dickens. The teacher who keeps up with this type of reading will find much to interest the sixth and seventh grade children. Margaret Lynn's *Step Daughter of the Prairie* has some good bits. *Reading and Living* (Lyman and Hill) gives excellent selections of this type of material. Other extracts are found in upper grade readers.

3. *Poetry*

A child should read and enjoy poetry quite as much as stories, and he will, if he is introduced to the best poems and has access to them. For rhythm (which should be a characteristic of most children's poetry) makes a quick appeal to even the most practical youngster.

If the old tale is usually best, we may certainly argue the other way for poetry, for in modern verse there are far more poems suited to children than in the older verse. Particularly are there the loveliest things being done for the small children, who, a short time ago, had to depend on Christina Rossetti's *Sing-Song*, R. L. S. *Garden of Verse*, and a few scattered poems — with, of course, Mother Goose for rhymes and jingles. *Fairies and Chimneys*, *When We Were Very Young*, *Jane*, *Joseph and John* and many others are added to our list for them. One must keep an ear open, too, to the work of Rose Fyleman, Ralph Bergengren, A. A. Milne, Hilda Conkling, Louis Untermeyer, and others.

There are several fine anthologies, also, which present poems for readers of all ages. This material is selected from the great and near-great poets of all time by real students of literature. Notable among these collections are *The Cambridge Book of Poetry for Children* (Kenneth Grahame); *This Singing World* (Untermeyer), and *The Home Book of Verse* (Burton Stevenson). *A Book of Verses for Children* (Lucas) is an excellent one for the youngest children. Agnes Repplier's *Book of Famous Verse* is for older children. The teacher should use only collections which have a well-known name attached, since selection is a fine art in itself.

c. Picture Books

These may be school-made or purchased. They vary from those with only a small amount of reading for the youngest readers, to regular texts with many pictures.

1. *Purchased Picture Books* (see also p. 204)

American, English, Russian, Japanese, French and Czecho-Slovakian artists have made some lovely illustrated books. The great difficulty with these books is their expense and the delicacy of their bindings. Especially well-chosen lists are found in *The Primary School* (Moore) and in *Permanent Play Materials* (Garrison).

2. *School-Made Picture Books*

Artistic and attractive picture books can be made by the librarian or teacher or by the older children. For further suggestions see Picture Collections (p. 231), also Pamphlets; Booklets (p. 148).

II. SOURCES OF BOOKS

Library books may be owned by the school or borrowed from various sources.

a. School-Owned Books

These should be bought new, as a general thing, direct from publisher or dealer. Where books are donated a definite list is submitted to givers from which they are asked to select. Requests for general contributions of books always bring poor books and much trouble. The best method of ordering books for the school library depends largely on the size of the school and the method of administration. The following sources and plans are listed.

1. *General Book Sellers; and Department Stores*

There are a number of large book concerns and department stores which make up book orders (see Appendix). This plan is convenient for the buyer, especially where clerical help is scarce.

2. *Publishers*

Publishers always give a good discount to schools. If the order is small or if clerical help is available, this is the least expensive method in buying.

3. *Book Sales*

Book bargains are worth watching for. Bargains and sales are usually advertised in the *New York Sunday Times*, Book Review Section, or other Sunday papers.

(*a*) Often publishers announce sales of shop-worn books at a fraction of the first cost. Get on their mailing lists.

(*b*) The rent libraries (such as Womrath) sometimes have valuable histories, biographies, and poetry on sale after the books are out of vogue. The teacher can obtain in this way many valuable books for personal needs.

4. *Inexpensive Editions* (5 to 15 cents each)

The following firms publish or sell inexpensive books, booklets, pamphlets, and leaflets:

All ten cent stores (especially at holiday time); A. Flanagan Company; Houghton Mifflin Company (The Riverside Literature Series); D. K. Knowlton Company (Excelsior Classics); F. A. Owen Publishing Company (Instructor Literature Series); C. M. Parker Publishing Company; The Penn Publishing Company; Unit Press.

b. Borrowed Books

There are outside agencies through which many additions can be made to the reading material already owned by the school.

1. *The County or City Office of the Local Schools*

A central library may be owned and books distributed by the County or City Department of Education. Books are sent on request to different schools and moved on after a certain time. This is an excellent plan where there is no public library and funds are limited.

2. *The Local Public Library*

This organization will often send collections of books to schools, and will sometimes even send a librarian for certain days each week, to help the children in using books or to give out books for home use. The American Library Association will give advice and help on the best methods of coöperation between school and library.

3. *Special Exhibits* (see Exhibits, p. 255)

4. *The State Library Commission or Extension Agency*

Practically every State has now its library commission. These commissions are doing a remarkable work in helping the schools with traveling library service. Sets of thirty to forty books are sent out to schools, and special requests for books are filled. The books may be kept from six weeks to six months and then exchanged for others. Each teacher should get in touch with the Commission and see what it offers.

5. *Private Libraries — of Children or of Friends*

Privately owned books may often be borrowed for a time.

III. SPECIAL PROBLEMS

a. Administration

1. *The Central Library*

A suitable person in charge of the library is essential. It must be clear that a school librarian's work does not mean merely handing out books or keeping order, but, as suggested earlier, (p. 201) is also a teaching task, which requires the ability to handle children, tact, a love for books, and a knowledge of the books in the library both as to content and as to their position on the shelves.

The *technical* work (cataloguing, classifying) which requires trained skill; the *mechanical* work (binding, repairing); and the *clerical* duties (labeling and shelving books, stamping cards) require much time, are very important factors, and are often overlooked in the school library plans. Any school that is trying to develop its library facilities should by all means get in touch with the American Library Association, which gives freely of advice for special needs, and also supplies pamphlets and information for all phases of library work. Other plans are found in books and pamphlets listed in the Appendix. The following suggestions are offered:

(*a*) A full-time, trained librarian is greatly to be desired and should be on the staff of every large elementary school.

(*b*) Having part-time librarians with some training is a possible plan for smaller schools. This may be a teacher in the school who is relieved from a number of her teaching duties, or it may be some one from the outside. Many library training schools are offering short courses for this kind of work. The chief difficulty is

that the work assigned is often too heavy for the time allowed, or the teachers who undertake the task are required to do too much teaching in addition to the library duty. The trained teacher-librarian should not usually be required to do cataloguing or repairing unless extra time is specially allowed for it.

(*c*) Coöperation with local public libraries or with the State Library Commission is possible in many places. These may aid schools in the following ways:

(1) By sending a children's librarian to the school on assigned days, to distribute books, discuss books with the children, and interest them in using books both for information and for pleasure.

(2) By sending an expert, from time to time, as needed, to catalogue and classify books and to keep the volumes in repair — that is, send them to the bindery, mend them in school, or direct the children in repairing work.

2. *The Classroom Library*

The regular teacher has charge of the books. Coöperation as suggested above is often helpful.

b. Housing

1. *The Central Library*

A separate room is essential. Plans for every new school building should include such a room, which can also house the other collections. Other plans (pp. 307–311) are sometimes necessary.

2. *The Classroom Library*

For the classroom library, a reading corner, screened off, (pp. 301, 305) from the room, or a reading alcove, with a low table (round if possible) and several comfortable chairs, is an attractive plan which will result in the books being used freely, as the children find the time or the need. A wide shelf will serve to hold the volumes, or they may be kept in any accessible place.

c. Use; Care

Books should be used freely by all the children for work and pleasure. Without the teacher's coöperation, however, many children will never learn to do this.

Some suggestions as to method are made in other sections (pp. 50, 142).

1. *Instruction*

(*a*) Explain fully to the children the arrangement and classification of the books.

(*b*) Explain (to older children) the use of the card catalogue.

(*c*) Show the children how to use the books (pp. 142, 143) in such a manner as to find out, by themselves and in the easiest and most productive way, the things they need to know.

2. *Plans; Activities*

(*a*) Bring into the classroom those books which are needed for special work or desired for other reasons. Place them in a convenient place where the children will notice and examine them. Later return the books to the library and refer the children to them.

(*b*) Use the bulletin board (pp. 305, 306) freely for posters, pictures, reports on books, and lists of interesting books.

(*c*) Have the children present a Library Program now and then at Assembly, with reports on books, new and old, a play, posters, and other interesting material. The Lincoln School reports a Shelf of Books program, in which each grade selects one or more books and represents them by children in costumes. Other children took part in the program by telling of book-making, the care of books, and related topics, and by showing specimens and methods of work.

(*d*) Have the children make posters illustrating books, Book Week, etc.

(*e*) Have the children write reports on books they have read.

(*f*) Have the children keep lists of the books they have read.

3. *Care of Books*

Teach the children to care for and respect the books.

(*a*) Point out to them that soiled hands and careless handling ruin books, and teach them the right way to open and to hold a book.

(*b*) Rouse their interest by showing them beautiful books and telling how the books are made.

(*c*) Let them repair books, make booklets; make paper.

d. Equipment and Supplies

The equipment needed depends largely on the plan adopted. Library equipment and supplies are now standardized and all details are carefully worked out. The American Library Association will furnish helpful pamphlets. Such commercial firms as the Library Bureau, Gaylord Brothers, and The Democratic Printing Company, will supply all needs. No school library should be equipped without expert advice. A few suggestions follow:

1. *Shelves; Cases* (see also pp. 329–332)

These may be purchased from the Library Bureau, or that firm will furnish blue prints for constructing by local workmen. The filing cases should always have rods.

2. *Tables and Chairs*

See Furniture and Fixtures (pp. 293–297).

3. *Bulletin Boards*

See Furniture and Fixtures (p. 305).

4. *Repair Supplies*

(*a*) For small jobs the following supplies from Dennison, Democratic Printing Company, or Gaylord are used:

(1) Transparent adhesive tape, for mending torn leaves. $\frac{3}{4}$ inches wide and 15 feet long, on spools, about 5 cents a spool.

(2) Transparent gummed cloth. In packages, 1 inch wide, 12 feet long; 2 inches wide, 6 feet long; 3 inches wide, 4 feet long; 25 cents a package.

(3) Opaque gummed paper for attaching loose leaves. Put up in rolls, 1 inch wide, 18 yards long, 25 cents a roll.

(4) Book needles, strong thread, and awl.

(*b*) For book work in a larger way, the "Toronto" method (Gaylord Brothers) and outfit solves the problem. The work can be done by older children. Write for information.

5. *Book Ends*

These help to keep the books in good condition. Have all pairs in the same room alike.

(*a*) Black enameled or japanned book ends cost about 10 cents a pair from a mail-order, library, or book firm; or plain ones of tin or zinc will be made for a few cents by any tinner. Any of these

when painted bright colors or decorated with gay designs are most effective.

(*b*) Fancy bricks, plain or painted, and ordinary bricks covered neatly with cretonne, or wall paper, make excellent and attractive book ends.

(*c*) Other book ends can be made of wood, cement (p. 69), or clay (p. 71), in beautiful designs and charming colors.

(*d*) Nickled book supports for shelf use cost 15 cents each from Democratic Printing Company.

6. *Typewriter* (any make); *Paper cutter* (p. 274); *Punch* (p. 276). These are all essential in a well-equipped library.

7. *Miscellaneous Supplies*

(*a*) A strong shipping box for transporting books costs $2.25 from the Democratic Printing Company.

(*b*) Cards, book marks, posters, etc., may be obtained from Gaylord Brothers; the Democratic Printing Company.

B. THE SCHOOL MUSEUM

COLLECTIONS; SPECIMENS; MODELS

MEANING; VALUES No one to-day questions the value of museums. It is entirely apparent that from the collections contained in them, children not only derive new interests, but gain a wider knowledge and a clearer understanding of many subjects. Education by seeing is a close second to education by doing. Moreover, the two are very much tied up with each other, for definite experiences and ideas are necessary for any form of worth-while expression.

What teacher has not thought longingly of the great city museums and the private collections of wealthy schools which open up so many opportunities for the children to whom they are accessible? And yet how few of the smaller schools and localities have realized that it is possible for them to share these benefits!

Now as a matter of fact, every school or every school

system can have its own museum and thus add tremendously to the richness and interest of its work. The museum may start out as only a handful of rocks or a small collection of birds' nests, but once begun it grows like magic, and its possibilities for growth and use are endless.

It is remarkable how much interest such a venture will arouse, especially if it is a school activity, and how much help will come from unexpected sources. Indeed in some cases, the small beginning in a rural school has led to a community museum of real significance.

The school museum is necessarily a composite affair. It must fill subject material needs and help in art education as well.

DEVELOPING THE MUSEUM

A museum may *begin* with a collection made by a group, or a chart worked out in connection with a special topic. The idea of starting it may spring from a visit to a larger museum, an outside exhibit, or may be aroused in many other ways.

It *grows* through new interests and through work in connection with it. Additions are made from time to time as the children see the need for certain things, or can find room for them, or as various worth-while materials become available. A gradual growth is best, both for educational reasons and for the sake of doing well the necessary work of preparation.

Once begun, the collecting of material should be a school activity, every group adding its share and each child on the lookout for new things. There is no better way of making a child's school work, especially in history, science, and geography, of vital interest and worth than by letting him help build up a school museum and then have free access to the treasure accumulated. If the parents and community can be included, so much the better.

Sometimes each grade or group specializes on a certain collection, which is kept in a special cupboard, shelf, or case, in the classroom or wherever is advisable. Other groups take contributions to this collection, and the responsible group accepts and classifies the offerings, or, if necessary, rejects them. The contents of the collection are borrowed or examined by the various groups as they will, arrangements being made in advance.

Another plan is for each group to make and exhibit the collection and then pass it on to the school museum, or else to the county office as the nucleus for a central museum, or as an addition to one already started.

The final decision as to what shall belong permanently in the collection, what shall be used for a time, and what shall be rejected altogether, should rest entirely in the hands of the teacher or the advisory committee.

SELECTION OF MATERIALS Naturally the effectiveness of the museum depends upon the wisdom exercised in selecting the materials; upon such practical matters as housing, arrangement, accessibility, visibility; and above all, upon the free, frequent, flexible use of the collection by the teachers and the children. Unless the materials are put to constant and proper use, they merely take up room and catch dust.

In view of all this, common sense must have a large part in the final selection, which must be made with great care. The collections must not be allowed to become "overgrown"; having too many things is almost as bad as having none. Large or fragile or very valuable things are not, as a rule, advisable. Only those things which can be kept in sight are of value for the collection. For the average school the most valuable materials are those which the children themselves make or collect: nature collections, models,

costume dolls, and the like. Art and industrial specimens are next in importance.

HELPFUL REFERENCES — Books and pamphlets which give helpful information and advice will be found in the Appendix.

MATERIALS; EQUIPMENT — Materials for illustrative purposes are needed and also the equipment for taking care of them. There is a permanent nucleus, which includes those basic things which are used by a number of children and called for year after year.

There are also temporary collections: exhibits and specimens which supplement the regular materials. Some of these serve their purpose speedily; others contain valuable objects which are either too numerous or too rare and too expensive for school ownership.

The following suggestions are offered for guidance, but they are not to be followed literally, since conditions vary so greatly. Each school must use what suits its needs and supplement the material as shall be necessary. I. Kinds of Material. II. Sources of Material. III. Special Problems. All prices quoted are approximate. Addresses are listed in the Appendix.

I. KINDS OF MATERIAL

a. Real Things

Real things, both finished products and specimens are of value to children, especially to the older groups. The following are suggested:

1. *Specimens*

(*a*) Indian work, clothing art — that is, beads, moccasins, bow and arrow, pottery, headdress, blanket, papoose case, arrow heads.

(*b*) Colonial or other period material, such as dresses, shoes,

samplers, pottery, chairs, spinning wheel or loom, furniture. These things require space and, in some instances, glass cases, so they are usually shown for a limited period.

(*c*) Baskets of all kinds.

2. *Nature Materials*

(*a*) Rocks and stones, such as granite, feldspar, sandstone, mica, slate, quartz. Those of the immediate environment are of chief value.

(*b*) Shells (fresh water and salt water).

(*c*) Minerals: iron, gold, copper, silver ores.

(*d*) Leaves (pressed and shellacked), bark.

(*e*) Birds (stuffed), birds' nests, eggs.

(*f*) Insects and insect nests (hornets, wasps, ants).

(*g*) Specimens: cotton (in boll), wool, silk cocoon, flax.

(*h*) Grains: wheat, oats, rye, corn — in full bunches showing actual height and appearance.

3. *Industrial Products*

In this division are shown raw materials, processes, finished product, and by-products of the following:

(*a*) Textiles: cotton, linen, silk, wool.

(*b*) Foods: cereals, flour, meat, milk, cocoa.

(*c*) Lumber: oak, spruce, yellow pine, poplar, cedar, chestnut, and white pine — showing rough, planed, waxed, stained and painted woods.

(*d*) Rubber.

4. *Art Materials*

Art objects: tapestry and other textiles, metal work, sculpture reproductions, china, pottery, carvings. These are discussed in Art (Chapter Five).

b. Models; Reproductions

Models or reproductions of all kinds are most helpful in school work, especially for the older children, who learn to construct many of them. Some are of passing value; others deserve a permanent place in the school museum.

These models are sometimes exact copies, correct in detail, in

full size or miniature size, of cotton gin, weaving looms, a spinning wheel and so on, and are really workable; also of wigwam and colonial home, and of Japanese dress. Sometimes the models are imitations, showing the general appearance or giving the effect of reality — such as a miniature scene of Arab life or a set of transportation models. The following list is suggested; selection should be made according to need and to available display space.

1. *Costume Dolls*

Caveman; shepherd; Arab; Indian; Eskimo; Greek; Roman; noble and peasant of Middle Ages; colonial character; and representatives of other special countries (Japan, Holland).

2. *Homes* (of any of the above, complete in detail)

3. *Boats* (of all kinds)

4. *Set of Transportation Models* (from an early period to the present)

5. *Industrial Models* (exact copies)

(*a*) Spindles
(*b*) Looms
(*c*) Potter's wheel
(*d*) Cooking utensils and stoves

6. *Primitive Tools and Weapons*

II. SOURCES OF MATERIAL

Material for the museum is obtained through gift, loan, rent, or exchange; through collection in various ways by the children and teachers; and through purchase.

a. Gift

Much that is really worth while will be given by people who have interesting things which they can no longer use or care for, if they are sure the articles will be appreciated and preserved. Many small things, such as specimens, models, and toys, will also be given.

b. Collecting

Gathering material here and there from any available source is a good way to begin collections and to continue adding to them. Each child keeps an eye open for natural and industrial

specimens, and for anything else that may come his way. There will be a delightful interest and thrill for him in unexpected discoveries. See especially Farm Bulletin 606 (Department of Agriculture) for helpful suggestions.

c. Exchange

This is a method which is not used nearly so often as it should be. Children of one community, or one part of the country or the world, can exchange certain products which they have for others which they lack. Careful planning is necessary and faithful work in collecting and arranging home products; but it is all valuable in an educational way, since it motivates a child's study of his own community and makes other communities, through direct communication, very real to him. Knowledge of postal charges, weights, and secure methods of packing is called for in this exchange plan.

d. Children's Work

The work of the children, especially in weaving, pottery, making models of people, inventions, and so on is often worth placing in the museum.

e. Loan or Rent

Many interesting objects can be borrowed or rented for a time. For full discussion see Exhibits (p. 255).

f. Purchase

Many manufacturing firms now sell, at a price which approximately covers cost, charts and specimens showing the processes of the production, manufacture, and distribution of their products. Lists of these are in the pamphlet *Material on Geography* (Eastern Illinois State Teachers College). Other lists can be made by watching the advertisements of firms that make the desired articles and then asking by letter whether they send out samples or specimens to schools.

Second-hand purchases are often made from people or dealers. The Industrial Arts Coöperative Service often will select and purchase certain materials for members (investigate).

Other materials can be bought directly from dealers or from miscellaneous sources, as follows:

1. *Nature Materials*

(*a*) *Minerals — Rocks*

(1) The Washington School Collection of 20 minerals and twenty rocks (good-sized specimens), each labeled and placed in a separate tray in a cloth-covered case with a set of unlabeled duplicates, costs $6. Students' additional small specimens, unlabeled (20 rocks, 20 minerals), cost 55 cents a set.

(2) A much larger selection is also possible at prices from 25 cents to $1 a specimen. All this material comes from The Chicago Apparatus Company. Write for price list. Ward's Natural Science Establishment and The Central Scientific Company also have them.

(*b*) *Insects*

(1) Insects, live cocoons, etc., come from Ward's Natural Science Establishment, The Comstock Publishing Company, and The Geography Supply Company.

(2) Specimen mounts for plants and insects are sometimes needed. These come in the following sizes and prices from The Chicago Apparatus Company: Size $2\frac{1}{2} \times 3\frac{1}{2}$ inches, 25 cents; 4×5 inches, 30 cents; 5×6 inches, 45 cents; $6\frac{1}{2} \times 8\frac{1}{2}$ inches, 75 cents; 12×16 inches, $1.50.

(*c*) *Soils*

Specimens of all kinds of soils can be obtained at about 20 cents a pound from The Chicago Apparatus Company.

(*d*) *Wood Specimens*

All ordinary woods will be furnished by a local carpenter, cabinet maker, or contractor at small cost; or furniture factories or mills will send them. See advertisements in popular magazines.

(*e*) *Samples of Natural Colored Cotton*

Samples of natural colored cotton (with seed) in pale gray, tan, and light green, for 10 cents (no commercial value, but interesting as a product) can be had from Mr. J. W. Brabham, Olar, South Carolina.

2. *Handicraft Specimens*

(*a*) *Indian material* — baskets, beadwork, plaques, blankets, pottery — comes from the following sources:

Beadwork, Sweet Grass Baskets; Mrs. Mary Gray, care Mrs. Smoke (Indian).

Plaques, Basketry, and Pottery; Tom Pavatea (Indian).

Basketry, Beadwork, Rugs, etc.; Mohonk Lodge Colony Catalogue.

Blankets, C. N. Cotton (dealer).

Plaques and Blankets, J. S. Hubbell (dealer).

Moccasins, A. C. Stohr (dealer) catalogue.

Baskets, Pottery; Cherokee Reservation (Indians).

(*b*) *Mountain Craft Work* comes from the following sources:

(1) Hooked rugs (a doll-size rug, 6×3 inches, costs 50 cents), rag rugs, braided rugs, hand-woven, home spun counterpanes and other materials; baskets, hickory chairs with splint bottoms, and crude earthenware pottery, can be had from the Alanstan Cottage Industries.

(2) Beautiful hand-woven homespun cloth in all colors comes from the Biltmore Industries.

(*c*) *Oriental* work — prints, tapestries, textiles, boxes, carving, and other art goods already discussed in Art (p. 167), are found in Oriental shops listed in the Appendix.

(*d*) *Arts* and *Crafts* of *Central Europe* — peasant embroideries, carvings, pottery, toys — can be obtained from the Czecho-Slovakian Shop.

(*e*) *Colonial* things, such as candles (hand-dipped), counterpanes, samplers, etc., are found in New England gift shops. Poulson's has many interesting reproductions.

3. *Sculpture*

Certain casts (round; relief) may have a place in the school museum. These should be selected by the art teacher or by a specialist. A limited list of decorative casts is found in Art (p. 166) with names of dealers who will also suggest, upon request, desirable pieces to meet local needs.

The Metropolitan Art Museum has for sale some small casts or reproductions of Egyptian sculpture and bowls and ivory carvings in foreign museums, which range from fifty cents to $3 (mail 20 cents).

4. *Models*

(*a*) Small models or reproductions of animals, tools, houses,

people, and machines, can be found at novelty and toy shops, Japanese and ten cent stores, and candy stores, particularly around Christmas time. The teacher has to pick them up as they are found. Dolls are always available.

(*b*) Reproduction of colonial candle molds, fire tongs, shovels, and irons, and other things are found in full size at gift shops, as are many miniature or toy reproductions.

III. SPECIAL PROBLEMS

Some of these problems are discussed elsewhere. A careful reading of Chapter Nine in full is advised.

a. Housing; Arrangement

Proper housing, labeling, classifying, and arranging are especially necessary for museum materials, since collections or sequence groups lose value when broken up or separated or if they are not in plain sight.

1. *Housing Plans*

(*a*) A special room (pp. 307–311) is almost a necessity for a successful school museum. Here may be kept both library and museum collections and other special material for geography, history, and art study. The size of the room does not matter so much, for a small space well organized can take care of many things.

The fitting-up of such a room depends largely on the available space and the use to which the room is to be put. Every inch of space should be carefully mapped out and utilized, and future as well as present material and books considered, for all plans should include growth.

(1) *Cases* (p. 332), *cupboards* (p. 331), and *shelves* (p. 329) are needed. Those cases and cupboards that are used for books and for some collections are open; others have sliding doors — of glass if possible, if not, of wood — with locks.

Three deep, open shelves, 15–16 inches wide, any length, 20 inches apart, are good for holding scenic reproductions of Arab life, of mining, or of other processes and conditions which may be changed from time to time. The lowest shelf should be 6 inches from the floor, and all should be well lighted. Movable cases (p. 332), open on both sides or with backs made of wall board

(p. 77), are good for holding specimens and are also used for separating walls.

Floor or counter (p. 333) cases with glass tops are most desirable but not necessary. These contain things which are particularly valuable or too delicate to handle.

(2) Tables and chairs (p. 293) of two or three sizes and heights are also needed for the children's use in reading and in examining material. In crowded rooms *drop shelves* (p. 330), 12 to 14 inches wide, are used instead of tables.

(3) Two low benches (p. 298) for the younger children are often needed.

(4) Bulletin or display boards (pp. 304–307) are essential.

(5) Screens (p. 301) are often needed.

(*b*) A well-lighted hall is an excellent place for many of the collections even if there is a special room, since the children passing to and fro may devote many spare moments to looking at them. If there is no special room, the hall is doubly important.

(1) Cases (p. 332), with glass doors and shelves preferred, built flush with the wall (i.e., back into partition space) are excellent.

(2) Wall space may be used for pictures, charts, and flat material.

(*c*) The end of the assembly hall may contain shelves (p. 329) and lock cases (p. 331) and take care of some of the collections. It makes an especially good place for exhibits.

2. *Arrangement Plans*

Museum materials need careful arrangement. Attractiveness, visibility, sequence, and the kind of material, as well as its suitable protection, must all be considered.

(*a*) All museum materials should be carefully and clearly labeled.

(*b*) Natural settings or backgrounds are very desirable. They include such material as birds' nests, insects' nests, Spanish moss on branches of trees; a cocoon on a twig; a spinning wheel in colonial surroundings. Picture backgrounds, such as settings painted on large pieces of paper or cardboard, period wall paper, and other makeshifts of this kind are helpful. A visit to a large museum will suggest other plans.

(*c*) Charts of industrial subjects may hang flat on wall, or be placed on a folding display, bulletin boards (p. 306), swinging racks or frames (p. 336).

(*d*) Larger materials may be kept wherever convenient, in an outer room, in cases, in cupboards, or elsewhere.

(*e*) Smaller materials may be kept in suitable containers, mounted on boards or charts, or in any way that the nature of the material requires, as, perhaps, on display boards (p. 306) or swinging racks.

(1) Small open boxes or boxes with partitions are usually the best receptacles for rocks, minerals, insects, wood specimens, and other things of like nature.

(2) Small bottles will keep liquids, powders, and very small materials.

(3) Charts made of large pieces of wall board (p. 77) bound with buckram or heavy gummed cloth (see Decorative Pictures, p. 253) are usually best for holding industrial collections which show processes (silk, flour). Fasten heavy specimens on with adhesive tape. Pictures to supplement the specimens and any necessary explanations, clearly printed, are also used on charts.

(*f*) Suitable protection is important.

(1) The fragile, perishable material — bunches of grain, flax, flowers, leaves, insects — may be protected by a covering of maline or netting, or by pieces of thin celluloid (see pp. 87, 97, 111). A thin coat of white shellac or picture varnish or paraffin also helps to preserve certain things, such as leaves. Dust the chart often with a soft brush.

(2) Other plans are noted elsewhere (pp. 321–322).

b. Use

The museum is used by the school in several ways. *Children* use it freely, see what they will, and follow up any special interest. They also go to the collections for help in working out their problems in handwork (how to make a loom, for example) and also in studying their lessons in history, geography, and so forth (as examining relief maps, a model of a Japanese house, or candle molds; identifying a bird or some other object, or other assigned work).

The *teacher* uses the museum to find illustrations for some special topic. When it is necessary to assemble material quickly for this

— as, for example, when specimens of earth, mineral, stone, and wood are needed at once for a lesson in science — various sources are drawn upon and a new temporary arrangement or grouping made. Again, the children are given special assignments for definite examination, as the model of the cotton gin, or a primitive sledge. That plan may also set a new interest or project going.

The *method* of use and administration depends largely upon the room and the arrangement, and the experience that the children have had in independent control and work. Each school must work out its own plan. If there is a separate room, the children should usually be supervised; the teacher and different older children can take turns at overseeing. Quiet, except when a group is in to examine a collection, is advisable. An individual child may go by himself to look up something, or a group of very reliable children may go in alone as a special favor.

If the room is very small, no use is made of it except to house material there and to let children come in small groups or alone, to see the material or to study.

If the room is outside the building, supervision during use is always necessary.

1. *For Free Observation*

Encourage the children to browse around at will and to ask questions about what they see or discuss it later with the teacher and one another. This provides excellent language work.

2. *For Assigned Study*

Be very definite and exact as to what is required. The older children take notes on the work, or make drawings.

3. *For Personal Study and Reference*

Show the children how to use material and where to look for special things.

4. *For Class Use*

(*a*) Be sure that the children can all see the material under examination. Sometimes it is placed on a table; sometimes it is held up by the teacher or passed around among the children. After the first showing it is left out so that the children can reëxamine it at leisure. This is important. A magnifying glass (p. 37) adds greatly to the interest.

(*b*) Be sure, also, that the children understand what they are

seeing and why. As a rule, if the material is to be used for a definite purpose, it is better first to prepare them for seeing it and then to show it to them. Encourage questions.

(*c*) Let the children have plenty of time for seeing the material. A hasty examination means a waste of time. If the class hour is too short, leave the material out afterwards and allow the children free access to it till all are satisfied.

5. *In General*

(*a*) Where it is possible, allow the children to HANDLE as well as see the material. It is better to repair things often or even to have them wear out quickly than to forbid this, for children, especially the little ones, need to touch as well as to see if they are to really get clear ideas.

(*b*) Supplement the materials of the school museum by special exhibits (pp. 255–260) and by excursions to larger museums, homes, buildings, and stores.

c. CARE AND CONSERVATION (see pp. 321–326).

C. SCHOOL PICTURES

Pictures of all kinds, still and moving, large and small, opaque, slide, and film, have a most valuable place in school work and are possible in every school, since compared with more bulky materials they present few problems of storing, expense, care, and use.

MEANING; VALUES Pictures supplement, illustrate, enrich, and enliven, both real experiences and book information, and may also aid in training a child's sense of color and form and developing his appreciation of both art and nature.

To be more definite, a trip to the docks to see a ship come in and unload, is much richer in significance if the children have also seen pictures which show how a ship is built, coaled, and loaded, or how its special cargo is produced.

A lesson in geography takes on additional meaning if it is illustrated by pictures that show the way the country and

people under discussion look, and that give some of the important industries of the region. Pictures of castle walls, moats, courtyards, armor, and soldiers make stories of the Middle Ages far more real and far more thrilling. A study of desert life will be much more vivid if introduced by pictures of desert scenes; or if the subject has already begun, the pictures will help in visualization.

The beautiful posters or lithographs of farm life, domestic duties, and other industrial work dignify and "lift up" drudgery, and help to a new point of view.

A sense of beauty of landscape or of form often comes through a picture which presents a special bit of trees, water, hills, or sky and suggests that there are other pictures to be seen if one will look.

Pictures are distinctly limited as to field, however, and a word of warning seems in order.

First: Pictures (even motion pictures) can *never* take the place of real things and experiences. With little children this is especially true, since their ideas of size and of the three dimensions are not clearly formed and it is easy for them to get an untrue image.

Again: Pictures cannot take the place of study and reading. This is especially noted and discussed in the section on Screen Pictures.

HELPFUL REFERENCES

Books and pamphlets which give helpful information and advice will be found in the Appendix.

PICTURE MATERIALS

Keeping these points in mind, we classify pictures under the three general heads, I. Picture Collections, II. Screen Pictures, III. Decorative Pictures. All prices quoted are approximate. Addresses are listed in the Appendix.

I. PICTURE COLLECTIONS

Certain school pictures are for temporary use or to go into permanent collections. They may be colored or plain pictures according to the way they are to be used.

Temporary pictures illustrating special topics and current happenings, such as a presidential inauguration; new state officials; a good roads campaign; a new bridge or new buildings, are often used on display or bulletin boards or on the wall for a day or so and discarded when they have served their purpose. There need be no further discussion of this kind here.

A well-planned, growing, carefully filled and accessible picture collection is a great help toward effective teaching. The collection may belong to a group, to a school, or to a group of schools. A successful plan combines all three arrangements; a small classroom collection of pictures that are often needed, a good school collection, and a large central collection.

a. Sizes

Pictures may be of any desired size. For general convenience, however, the best sizes are from 4×6 inches to 11×16 inches. In a good-sized collection, large pictures are expensive to mount, and hard to care for and handle, and small ones are easily lost. Judicious trimming will successfully reduce the very large pictures.

b. Qualities

1. *Art Pictures*

Pictures for giving pleasure and encouraging appreciation of art should have color and should measure up to real art standards. Subject and detail are of secondary importance; any attractive pictures may be chosen.

2. *Illustrative Pictures*

The illustrative pictures should be as good as possible, but subject, detail, and accuracy must often be considered first. Color

helps but is not necessary. Only those topics which belong in the regular school work should be chosen for the permanent collection.

c. Selection

The following pictures are suggested as being generally needed in the elementary school collection. Others may be included.

1. *Primitive Life and Peoples:* cavemen, Indians, Eskimos, Arabs, early shepherds.

2. *Other Peoples:* Norse, Greeks, Romans, and Spaniards of ancient times and of the Middle Ages.

3. *Production* (early and modern methods): farming, mining, fishing, lumbering.

4. *Crafts* and *Industry* (any period).

5. *Transportation* (early and modern types): beasts of burden, caravans, wagons, sledges, trains, boats and ships, airplanes.

6. *Trade* (early and modern methods): docks, markets, bazaars, and stores — including loading and unloading supplies.

7. *Manufacturing* (on a very limited scale, for older children only): machines, processes, plants.

8. *Nature:* birds, insects, animals, fish, flowers, trees, landscapes.

9. *Geographical formations:* valleys, hills, mountains, plains, seas, rivers.

10. *Foreign People: with Distinctive Clothing, Homes, and Customs:* Chinese, Japanese, Dutch, Russians, and others included in history or geography topics.

11. *Art Objects,* or reproductions of famous paintings and sculptures.

12. *Historical Events* (older children): American, English, European.

13. *Anatomy, Physiology, Domestic Science* (older children).

14. *Architecture:* homes, buildings.

15. *Gardens, Lawns, Grounds.*

d. Sources of Pictures

Some pictures cost nothing at all but the trouble of collecting and preparing for use. Others cost only a little. Still others are quite expensive.

Magazines are an endless source of supply. Beautiful colored pictures come from the covers and from the reading and advertising sections alike. Rotogravure supplements of newspapers often contain excellent pictures for school purposes.

Calendars and other advertising material are sometimes usable.

Trade catalogues have good cuts and often artistic color prints.

Travel folders have fine pictures. Travel posters are excellent.

Many firms now publish pictures which, besides being beautiful, are accurate in the details and the information that they offer.

Posters and charts of all kinds are plentiful.

Post cards are to be had in thousands of subjects and in beautiful colors.

Various sources are listed below; other addresses can be found in books listed in the Appendix. Send for catalogues and lists as desired.

1. *Art Pictures*

Small pictures for work that develops appreciation of art, and for use in the study of art and history and for illustrating art and craft objects and processes to older children, can be obtained as follows:

The Chicago Art Institute, Metropolitan Art Museum and other museums sell reproductions of their pictures and art objects in color, at from 5 to 50 cents each. Especially good are the charming studies, issued by the Metropolitan, of rugs, pottery, plate, jewelry, etc., size 4 × 5 inches, 15 cents each.

The Detroit Publishing Company, United States Lithographing Company, Brown Robertson Company, Elson Art Education Company, and other firms listed in this section have small pictures, plain or in colors, at 10 cents upward.

2. *History and Geography Pictures*

(*a*) Colored posters and smaller pictures for teaching *civics* and *history* are issued by the National Child Welfare Association, at about 60 cents each; *Our National Holidays* (14 × 22), 11 subjects, are good. A charming set of 10 pictures (11 × 14), "Children of Many Lands," at $1.50 for the set, is recommended.

A very attractive set of historical pictures by Penfield are sent free to schools, as long as they last, by Hart, Schaffner & Marx Clothiers (Chicago, New York).

(*b*) Historical pictures, carefully and accurately drawn, are published by Longmans, Green & Company. Some of these are in color, others are black and white. The larger ones come in color at $1.25 to $1.50 each.

Smaller sets (12 pictures each) illustrate different periods in history, 11th to 16th centuries, and cost, per set, $1.30. A set of 12 pictures on English history (6 × 9 inches), printed in colors, costs 50 cents. These sets are excellent for older children.

(*c*) Large colored history pictures (26 × 36 inches), which cost $1.60 unmounted, give accurate studies for history work, and come from The Johnston-Nystrom Company. The teacher may select from a long list those suited to her purpose in the upper grades.

(*d*) Annual reports of the Isthmian Canal Commission contain useful geographic pictures, colored and black-and-white, large enough for school use. Apply to the Superintendent of Documents, Washington.

(*e*) Two foreign firms have excellent history pictures (send stamp for illustrated catalogue). These are:

(1) N. C. Rom; Danish historical charts which give good pictures of vikings; colored (19 × 31).

(2) Philip, George & Son, 32 Fleet Street, London. An illustrated guide to their geographical and educational publications, sent on request, includes lithographs of geography and history subjects. Especially interesting are *Types of Nations* and *History of Civilization.*

(*f*) Color maps, pictures of landscapes and people, and a variety of illustrative material in connection with history, industries, and physical geography, are issued by The National Geographic Society in extra publications and pictures.

(*g*) Beautiful history, industry, and geography pictures are found among the large lithographs and posters listed under Decorative Pictures.

4. *Nature; Science; Pictures*

(*a*) Science Maps, life history charts, and nature pictures in

color can be obtained from The Comstock Publishing Company. These vary in size and price. Star maps and life history charts of trees, flowers, birds, fish (20 cents), are recommended for third, fourth, fifth, and sixth grades.

(*b*) Bird and Nature Pictures of good color and drawing (7 × 9) are obtained from J. H. Dodson, who publishes the Mumford Pictures; 1 cent to 50 cents. Also from the Singer Sewing Machine Company (American Singer Series), free in limited quantities to schools.

(*c*) Charts of cloud forms are made by the United States Department of Agriculture, Weather Bureau. Apply to Superintendent of Documents, Washington.

(1) Blue print 23 × 16 inches, 5 cents.

(2) Classification of clouds, colored, 24 × 20 inches, 25 cents.

(*d*) Valuable science pictures are published by The National Geographic Society.

(*e*) Health posters and pictures can be had from The National Educational Association, The Child Welfare Association, The Child Health Association, The Tuberculosis Society, The Red Cross, many of the government bureaus, and also many advertising firms.

5. *Miscellaneous Pictures*

(*a*) *Post Cards:* Picture Post Cards, showing many art studies, lovely reproductions and interesting facts of geography, science, history, and industry are now plentiful; they are invaluable for school use. They are given by the children and by friends who travel and are willing to share or donate post-card collections, or can be obtained through exchange or through purchase at art stores, drug stores, ten cent stores, museums, art galleries and picture publishers.

(1) The Cizek Exhibit; charming card reproductions in color of children's work, 10 cents each.

(2) The Czecho-Slovakian Shop has colored cards, 3 to 10 cents each.

(3) The New York Aquarium has some attractive post-card studies of fish, 3 for 35 cents, postage prepaid.

(4) The D.A.R. National Headquarters, in Washington, has some excellent colored colonial cards, 5 to 10 cents each.

(5) The Detroit Lithographing Company has a most extensive collection of beautifully printed cards of all kinds, especially recommended for lantern use on account of clear detail and good color; 2 to 5 cents each. Investigate.

(6) Ezra Meeker has good history post cards.

(7) Rudolph Lesch has cards in color and in black and white; some of these are silhouettes, others reproductions, others prints. Gerda Schmidt's silhouette cards come in three series of five or six cards each.

(8) The Chicago Art Institute has post cards of many of its objects and pictures; black and white, 3 cents each; colored, 5 cents.

(9) The Metropolitan Art Museum, New York City, has six hundred subjects in photographs: paintings, sculpture, Egyptian, Greek, and Roman antiquities, ceramics, textiles, and woodwork; each 5 cents.

(10) The Smithsonian Institute of Washington has many post cards of value.

(11) The Society for the Preservation of Wild Flowers has most attractive post cards of native wild flowers, with descriptions and suggestions as to the care of the flowers; 25 cents for a set of twelve.

(12) David McKay has charming post cards of child life and of nursery rhymes by Willebeck LeMair at twelve for 75 cents.

(*b*) *Miniature Pictures*

(1) Small pictures (gray and brown, with a few colored prints of animal life included) are sometimes desirable: reproductions of painting, sculpture, and also cards illustrating history, science, and other topics. They cost from 1 cent to $1, and are of some value to older children. These should not be used with younger children at all, nor for decorative purposes; their chief value is for illustrating notebooks, charts, detailed study.

Among these are the *Perry pictures*, *Brown prints*, *Medici prints*, and *Elson miniature pictures*. Elson pictures, 5 cents, 3×4; 20 cents, 5×8, sepia, are most artistic.

(2) Gummed color prints, for notebooks or scrapbooks, are used by all the children. In sheets of ten, five sheets for $1, from Brown Robertson, and in sets of twenty stamps ($2\frac{1}{2} \times 3$

inches) for 10 cents a sheet from H. R. Mitchell, New York Zoological Park.

(*c*) *Magazines and Papers:* Valuable picture materials come from the following and other magazines and papers:

National Geographic, *Illustrated London News*, *Asia*, *New York Times* (Sunday), *Current History*, *Washington Post* (Sunday), *The Orient*, and women's magazines.

e. Special Problems

1. *Building a Picture Collection*

A picture collection may be built up in several ways. It may be started with a few pictures brought by a group of children to illustrate a topic in some class — methods of travel; the study of Asia; birds. Sometimes a single picture brought in by a child may provide an incentive. Often the teacher introduces pictures which suggest additional contributions. Then, as new needs and interests arise, new sets of pictures are started, and at the same time those already on hand are supplemented by gifts from teacher, children, or friends. As with other collections, much of the value depends upon the children's part in making and using it; so they should be encouraged to help as much as possible.

The school or class collection should not be allowed to become too large or to grow too rapidly. It easily gets to be unwieldy and hard to keep in order, classify, and use; therefore only the best pictures should be kept. There should be occasional overhauling of the lot and throwing out of the soiled, torn or less attractive pictures. Good surplus or duplicate pictures may be passed on to the collection of another room or school, or to the central collection; or they may be made into scrapbooks for gifts.

Naturally a picture collection for a school system is more extensive than that for a school or class, requires much more organization and care, and has the additional problem of distribution. The pictures are collected, prepared, and used as in the school collection. Suggestions for distribution are found elsewhere (p. 323).

2. *Classifying Pictures*

The largest problem in working out a picture collection is that of classifying and arranging. Much depends upon conditions. The larger the collection, the greater the difficulty. For the central collection, the Newark Museum plan (see *Educational and Decorative Pictures*, by Dana) is most helpful.

(*a*) In general: two main divisions seem natural.

First, the pictures used to develop artistic appreciation and to give pleasure, which need no classification except as to size.

Second, the pictures used to illustrate school and life topics; these need careful classification.

(*b*) More definitely: the detailed classification requires much thought. The average teacher finds the most commonly used topical name best; for example, pictures of Indian pottery would be filed under *Indian* rather than under Pottery.

Some one system should be decided upon and followed carefully. Indians, Eskimos, Early Shepherds, Greeks, and the names of other peoples may be used for general heads; under each of these heads would come *Food, Clothes, Homes, Industries, Customs*, and *General Environment.* Or it might be the other way round. Then again, such general heads as Industry, Trade and Transportation, Inventions, may be chosen and the desired subdivisions made. A school subject, as Geography, is not a good topical heading, since in many cases the same pictures will also be needed for history and science, and in every case a definite topic is needed: Trees, Flowers, or Land Formations, for example.

3. *Preparing Pictures for Use*

Pictures may be left loose, or mounted on cards or large wall charts, or pasted in scrapbooks (see Picture Books, p. 148). The scrapbooks are best for little children; the wall charts are good in halls or museums. The loose pictures are best for general purposes; they may be mounted or unmounted.

(*a*) It is often a good plan to paste several small pictures relating to the same topic on a larger mount. Often larger pictures can be cut down to advantage.

(*b*) It is usually best to trim pictures close (post cards excepted) with a paper cutter (p. 273), cutting off all advertising, print, and margins — sometimes even part of the picture.

(*c*) Mount if that is desirable.

(1) On heavy, tough paper or cardboard (tablet backs, cardboard from boxes).

(2) On large sheets of composition wall board (p. 77) for wall charts.

(*d*) Use flour paste (p. 104), spread evenly; rub till the picture is smooth; then press it under a heavy weight till it is dry.

(*e*) A thin coat of white shellac (p. 110) will help to preserve loose pictures.

(*f*) Label each picture in large, clear letters on the back at the upper end, with the labels in uniform position. Label scrapbooks on the cover and charts at the top. Labels go under each small picture.

4. *Using a Picture Collection*

(*a*) Allow older children free access to pictures. Encourage them to use pictures for reference in study period as well as for pleasure in free time.

(*b*) Post pictures of special interest or unusual beauty on a display or bulletin board, a screen, or a lower wall, for a short time. Sometimes call attention to these with emphasis on special points to be noted; at other times say nothing, but leave the children to discover the points themselves.

(*c*) Use pictures in class to illustrate the lesson; hold them up before the class or pass them around so each child can have a good look. Discuss freely.

(*d*) Have a special tablet or small board for displaying pictures of artistic value and change these often. Encourage noticing and discussing these, and asking for the return of favorite pictures.

(*e*) Transparent celluloid holders can be had in any size desired from Gaylord Bros. Those $5\frac{1}{2} \times 8\frac{1}{2}$ cost 20 cents each; those 9×12, 40 cents each. They are excellent for protecting delicately colored pictures. Send for samples. These holders can also be made by cutting sheet celluloid into proper sizes and fastening the pieces with eyelet punch or clips to cardboard backs.

ALL PICTURES MUST BE RETURNED AFTER USE TO THEIR PLACE IN FILE

5. *Housing Pictures*

(*a*) The pictures can be kept in the museum, or in the classrooms. Hang wall charts or large pictures on the wall or keep them in floor racks or on swinging frames or racks (p. 336).

(*b*) Keep scrapbooks on bookshelves or on a low shelf in the classroom or the library.

(*c*) Keep loose pictures (small) in file (p. 333) behind index or name cards.

(*d*) Floor racks or cases for large pictures are needed where there are too many large mounted pictures (18 × 20 inches, up) to hang them all on racks or walls. Those used in the Newark (N.J.) museum, seem the most practical. For description see *Educational and Decoration Pictures*.

II. SCREEN PICTURES

VALUE; NEEDS Screen pictures, moving or still, are a most effective aid in modern education. By means of them wonderfully real presentations of far-away places, industrial activities, and many other worthwhile things are brought to the children in school and to adults out of school. The requirements are a picture machine, films, slides or printed pictures, and a screen.

a. The Machine

There are so many kinds of machines, and the prices are so varied, that any school can supply its need. Moving-picture machines with many attachments (which show films, slides, and printed pictures), and a motor — if there is no electricity — come in different makes, portable and semiportable, and cost from $275 to $500. Stereopticons, which show films, slides, or printed pictures, vary in price from $50 to $250. Smaller machines, which show only rolls of films, are as low as $25. Each year brings new possibilities and better terms.

1. *Definite Recommendations*

Because of these rapid changes and improvements, it is impossible to make definite recommendations. When ready to consider or order material, write to your State Department of Education, and to the Bureau of Education, for up-to-date and reliable advice, and follow it.

2. *General Suggestions*

(*a*) In selecting a school machine the following points must be considered:

(1) Is the picture machine to be used for schoolroom, auditorium, or both? How large is each?

(2) Will the machine be moved often? Used often? Who will operate it?

(3) Is there electricity in the buildings?

(4) What is the State Insurance law for school property?

(5) What kinds of pictures are available for use? To whom will the pictures be shown?

(*b*) The following general recommendations are made:

(1) For the large school or group of schools, or for community use, when the exhibition will take place in large rooms or in a hall, the moving-picture projector with all its attachments seems best. The difference in the cost of this and a high-grade stereopticon is not great and it has, also, more possibilities of various uses and financial help.

(2) The small school without an auditorium will find a film-slide lantern, a small stereopticon, or a post-card projector very helpful and more practical than the larger machines.

(3) The more combinations or attachments it has, the better service a machine gives for general use.

(4) An ideal arrangement for schools is a moving-picture machine for general use and a small stereopticon which shows films, slides, and ordinary printed pictures, for classroom and special use.

b. The Pictures

1. *Selection*

The pictures, whatever the type of projector selected, should be chosen with great care, both for school use and for community pleasure and information. This is especially true of the movie film. All should be of the highest standard. Only those really needed should be selected, and no trashy or "popular" ones even considered.

Suitable lists of pictures of all kinds may be obtained from the following and other sources:

(*a*) State Departments of Education, State Federations of Women's Clubs

(*b*) The United States Government: Departments of Agriculture, Labor, Interior (Bureau of Education)

(*c*) Society for Visual Education

(*d*) Catalogue (25 cents) of National Committee for Better Films

(*e*) Women's magazines

(*f*) Makers of Machines

(*g*) Pamphlets:

(1) *Material on Geography*, Eastern Illinois State Teachers College

(2) Pamphlet No. 1, *Guide to Study Sources and Materials of Educational Moving Pictures*, National Child Welfare Association.

2. *Kinds and Sources*

There are many kinds of pictures and many sources from which to obtain them. The pictures may be film, slide, or printed pictures; school-owned; or for temporary use.

(*a*) A permanent collection of pictures should be owned by the school for repeated use as needed. Keep these carefully classified and filed (p. 333).

(1) *Post cards* (p. 235) and other printed pictures (p. 233) are excellent for use in many picture machines, and are inexpensive as well.

(2) *Slides* and *films* for the school can be made from photographs or other pictures.

(3) All manufacturers have *sets of pictures* for machines. They are usually well selected by experts, and are improving steadily.

(*b*) *Temporary pictures* can be obtained for a limited period free of charge save for postage, or at low rental. Investigate.

(1) Many *industrial* firms send out films or slides for advertising purposes showing the various industrial processes of their products; these slides make excellent material for use with the children. The children may write asking about a possible loan of films. The advertising columns of the popular magazines will give addresses.

(2) *Railroads* frequently have films on scenery, safety, and other topics.

(3) *Health Organizations* frequently send out propaganda films and slides. They are usually better for use at parents' meetings than for children (those on disease, for example); but those on posture, clothes, shoes, and the care of babies are often practical for older children.

(4) Certain films are sent out by various bureaus and departments at Washington: the Forestry Bureau, the Reclamation

Bureau, the Indian Bureau, the Departments of Agriculture and Labor, and others.

Other organizations (see Appendix), such as the National Geographic Society, and various scientific societies, and museums often have excellent slides which can be borrowed.

Art Museums (Chicago, New York) have collections of slides and films for renting.

(5) The Yale University Press sends out a splendid series of historical films illustrating the Pageant of America.

c. Screens and Shades

1. *Screen*

A suitable screen is needed — one of correct size and having a smooth white surface. Special screens for light or dark rooms are no longer needed, since rapid progress has been made in developing daylight lanterns.

A screen which rolls up is best; this can be purchased.

A blank wall space may be used.

A piece of white cloth may be hung over blackboard or wall.

2. *Shades*

If it is necessary to darken the room, use heavy dark window shades over the ordinary shades. They may be made of black canvas or other heavy material tacked on old shade rollers; sometimes the old dark shades that have been discarded in favor of new kinds may be used.

d. Special Problems

1. *Building, Housing, Classifying of a Screen Picture Collection*

Proceed as in any other picture collection (pp. 237–240)

2. *Using Screen Pictures*

(*a*) *Mechanical Use*

The life and effectiveness of the machine depends upon its proper mechanical use and care.

(1) Follow the printed directions without the smallest change.

(2) Have one or two operators, accustomed to showing pictures, and do not let the machine be handled by unskilled persons.

(3) Keep the machine clean and in good condition, with all the attachments together.

(4) In order to get good, clear results when showing post cards or other printed pictures, the room must be very dark and the machine within a few feet of the screen. A small clear picture is better than a large dim one.

(*b*) *Educational Use*

Many suggestions for use come with slides and films. *The Keystone Manual* offers excellent help; so does *The Visual Education Magazine;* and each teacher has personal methods and purposes. Only a few suggestions, therefore, seem necessary here:

(1) All pictures shown during school hours should be of educative value.

(2) The picture lesson should be used with moderation. There is always danger that the children will grow lazy, mentally and physically, through mere looking on, or indifferent and *blasé* from too much stimulation. Candy spoils the taste for plain food.

(3) The picture lesson should never crowd out the children's active work such as handwork, dramatic play, games etc., since after all it is doing, not seeing, which counts most.

(4) In most cases the pictures should follow real work and study in connection with the topic pictured, after real interest and intelligent questioning has been already aroused. Their use should stimulate to further work.

(5) In some cases the picture may introduce or close a topic.

(6) The children should be encouraged to ask questions at any time and call attention to special points of interest. Older children give lectures and illustrate them with screen pictures chosen by themselves.

(*c*) *Community Use*

The picture machine serves many out-of-school purposes. It may be used:

(1) To present certain civic or hygiene problems which will instruct or stir to action — as for example, the problems of tuberculosis or of better school buildings.

(2) To raise the community standard of taste in such subjects as home-building, gardens, pictures.

(3) To raise money for school needs and to pay for the machine.

(4) To provide suitable amusement for children or grown-ups: children's movies, good comedies, historical film stories.

(5) To aid the work of civic organizations.

III. DECORATIVE PICTURES

Good pictures play an important part in the art education (p. 161) of children; they should be found on the walls of every schoolroom. The following suggestions may help in the selection of pictures:

PRINCIPLES OF SELECTION

Decorative Pictures should always have color. Black and white, brown, even colored half tones, are too cold and lifeless to become a permanent part of the child's environment, though they are excellent for temporary illustrative use. The children need richness, vividness, and warmth in addition to line and form. Beauty is only at its fullest when color is present.

Pictures should appeal to the imagination of children. They may do this through color or treatment as well as through subject. Any picture which has this quality of appeal has a place in any grade. Children, animals, and easily recognized things are not always needed in the decorative type.

Pictures should also be large, both as to general size and as to detail. A small picture is lost on a wide expanse of wall space, and hanging too many pictures in a given area produces a "spotty" effect which is very inartistic. Use the small, lovely pictures in scrapbooks or the "pleasure collections," or, for a time, on the bulletin or display board — not on the walls for permanent decoration. Large masses, bold

outlines, and large figures and details are also needed. Small details lose character and value when seen at any distance. Possible exceptions may be friezes where a group of smaller pictures gives a mass effect, and a choice picture — a Japanese print, for example — of especially lovely color which may fit into a narrow panel or space and hang low enough for careful examination. But for wide hall spaces and high hanging, the rule holds.

Pictures should be few in number. A picture-gallery effect is not desirable in our schoolrooms, where we are trying to build ideals of good taste. Two or three large pictures often give all the decoration of this kind that is needed.

The following pictures are suitable for school decoration; some of them are within the reach of any school.

a. Colored Lithographs

Colored lithographs or prints fill these needs more completely than any other type of picture. These are growing rapidly in popularity and are replacing the more subtle and delicate reproductions in color of old masters and modern painters. Not only are they decorative but they supply fine illustrations of history, geography, and industry. Some of the most beautiful work being done in the art world to-day is along this line. Fortunately for schools, it is most reasonable in price; excellent copies from reliable firms cost from $2 to $10, according to size.

1. *German Prints or Auto-Lithographs*

These may be ordered from agents in this country or in Germany, or from the publishers. They are imported, duty free, 25 per cent discount for schools. When they are bought in this country the cost is slightly greater, but that difference is overbalanced, for the average buyer, by the convenience. A good plan is to send to publishers in Germany for catalogues, and then order through agents here or abroad.

Publishers:

R. Voightlanders Verlag (Leipsig, Germany).
B. G. Teubners Verlag (Leipsig, Germany).
Merfeld & Donner Kunst Verlag (Leipsig, Germany).

Agents:

Rudolf Lesch, Atkinson Menzer Grover Co. (Rhine Prints). Adolph Weigel.

(*a*) The following selections are made from the stock carried by Rudolf Lesch, who will also aid with other selections for special needs. All these pictures are subject to 25 per cent discount for schools. It is well to verify the description before ordering, and to enquire about recent pictures, since new lithographs are being added from time to time.

(1) *For Kindergarten, First and Second Grades only:*

502 E. Rehm, *Fool's Paradise*, 16 × 40 in. $4.
(Gay dancing figures, bright colors; Frieze.)

514 M. Baurnfeind, *Puss in Boots*, 16 × 40 in. $4.
(Bright fairy-tale picture; Freize.)

425 (M & B) I, B. de Hoog, *Mother's Happiness*, 22½ × 27¼ in. $10.
(Cottage interior; mother, baby, and child; soft colors.)

(2) *For Fifth and Sixth Grades only:*

*528 (M & B) I, W. Blanke, *Spanish Castle*, 22¾ × 30½ in. $10.
(Beautiful picture, rich vivid greens, blues, and other colors.)

191 (M & B) I, A. Barducci, *Crosswalks of Dominican Cloister*, Novella, Florence, 18 × 27 in. $10.

326 (M & B) I, A. Barducci, *Arch of The Bargello*, Florence, 16 × 26 in. $10.

384 (M & B) I, G. Guiliani, *Interior of Francis Assisi*, 17⅝ × 27 in. $10.
(Three beautiful architectural pictures with good colors; any one of them will be satisfactory for decorative as well as for illustrative purposes.)

477 (M & B) I, K. Leipold, *Fishing Boats*, 23 × 29 in. $10.

478 (M & B) I, K. Leipold, *Mill in Holland*, 25 × 29 in. $10.
(Two attractive pictures in soft, gray, misty effect which will need good light to bring out the values.)

(Rhine) 131, O. Bauriedl, *The Glacier*, 21 × 29 in. $4.
(Excellent representation; for geography or upper-grade classroom.)

(Rhine) 141, K. Biese, *Winter Sport*, $16\frac{1}{2} \times 21\frac{1}{2}$ in. $3.
(Snow scene in mountains.)

(Rhine) 217, Fr. Beckert, *Village Street in Saxony*, 12×16 in. $2.

F. Marriott, *Fountain at St. Paul*, $15\frac{1}{8} \times 17\frac{7}{8}$ in. $5.
(Houses, people, courtyard; good color.)

(Rhine) 79, F. Hecker, *The Old Mill*, 21×29 in. $4.
(Mill, water; good colors.)

(Rhine) 507, Th. Herrmann, *Boats on the Canal*, 16×40 in. $4.

(Rhine) 233, H. Petzet, *Fishing Boats Landing*, 12×16 in. $2.
(Two interesting pictures; soft colors.)

(3) *For All Grades:*

*Seemann Print large #285, F. Stuck, *Spring Dance*, $17 \times 18\frac{1}{2}$ in. $3.
(Figures dancing in circle: most attractive, bright colors.)

*J. Townsend, *The Treasure Ship*, 15×21 in. $6.

*C. A. Wilkinson, *Oak and Hemp*, $15\frac{1}{2} \times 22\frac{1}{2}$ in. $3.

*(R. V.) 197, A. Liedtke, *The Merchantman*, $21\frac{5}{8} \times 29\frac{1}{2}$ in. $4.
(Three beautiful ship pictures in good colors.)

(Rhine) 159, H. Herrmann, *Flower Market in Holland*, 20×24 in. $4.
(Very attractive; flower stalls out of doors; old favorite.)

(R. V.) 159, H. Volkmann, *Harvest Time*, $27\frac{7}{8} \times 39\frac{1}{4}$ in. $6.
(Stacks of wheat; golden-brown; excellent.)

(Rhine 32, H. Volkmann, *The Cornfield*, $27\frac{1}{2} \times 39\frac{1}{2}$ in. $6.
(Field of ripening wheat, golden-yellow; excellent.)

*(R. V.) 184, H. Volkmann, *Mustard Fields*, $27\frac{7}{8} \times 39\frac{1}{2}$ in. $6.
(Landscape; yellow mass of blossoms; very good for dark room.)

*(Rhine) 11, W. Georgi, *Plowing*, $27\frac{1}{2} \times 39\frac{1}{2}$ in. $6.
(Landscape, large bold outline; man plowing with oxen; good color; excellent for any room.)

(Rhine) 34, E. Kanoldt, *Oaks*, $27\frac{1}{2} \times 39\frac{1}{2}$ in. $6.
(Landscape; rich greens; blues.)

*B. Bolkmann, *Autumn*, $27\frac{1}{2} \times 39\frac{1}{2}$ in. $6.
(Landscape; deep red trees.)

*347 (M & B) I, O. Jernberg, *Golden October*, $22\frac{3}{4} \times 27\frac{1}{2}$ in. $10.
(Landscape, trees in yellow-brown; good for dark room.)

463 (M & B) I, F. Mueller, Landeck, *Oaks by the Lake*, $20\frac{1}{2} \times 30\frac{1}{8}$ in. $10.
(Landscape; water, sky, green trees.) $10.

266 (M & B) I, H. Rudisuhli, *Meadow Brook*, 16×22 in. $7.50

376 (M & B) I, H. J. Weisenbruch, *Summerday in Holland*, 19×29 in. $10.
(Brightly dressed people, interesting grouping.)

*J. Goosens, *The Carrousel*, $16\frac{7}{8} \times 24\frac{3}{8}$ in. $7.50
(Charming picture; merry-go-round; gay colors.)

(*b*) These prints published by Merfeld & Donner, cost $2, $6, $8, and $10 and must be ordered from Germany.

Size	*Artist*	*Picture*
30 × 41 CM	Beckert	*Out of the Gate* (Geese)
55 × 75 "	Au Lobourage	*Tilling the Soil*
55 × 75 "	Brandel	**Golden Autumn* (Trees)
55 × 75 "	Schact	*Pasturing* (Sheep)
14 × 21 "	Barth	*Mower*
14 × 21 "	Barth	*Sheaf Binder*
7 × 21 "	Schact	*Pear Tree in Bloom*

2. *French Lithographs*

Eugène Verneau carries the delightful, decorative lithographs of Henri Reviere. These are in three sizes; 35 × 25 inches, 21 × 18 inches, and 26 × 12 inches. The prices are low, but duty must be paid. Investigate.

3. *Cizek Reproductions*

Charming color reproductions of the work done in Professor Cizek's famous school of art for children in Vienna, are obtained from the Cizek Exhibit, Greenwich, Connecticut. Especially recommended for wall decorations are the following prints:

Spring — child standing on the top of a wind-swept hill, clasping pink and white flowers against her yellow dress.
Size 21" by $18\frac{3}{4}$".....$1.50

Frieze — in two parts, a procession of laughing, dancing children in gaily colored costumes.
Each part, 35″ by 20¾″ $1.50
Both parts $2.50

4. *Foreign Tourist and Travel Bureaus*

These issue many large and beautifully colored posters by well-known artists, illustrating studies of industry, scenery, and other interesting subjects. They may be had by schools for postage, or at a small charge (usually about fifty or seventy-five cents) as long as the supply, *which is limited*, holds out.

(*a*) The London Electric; London Midland and Scottish Railway; Italian Tourist Office; Swedish Travel Bureau; Swiss Federal Railways, and others will often supply these posters to schools.

These posters are changed so constantly that no selected list can be given. But the "London Electric," and London Midland sends out a list of titles on request, if a stamped envelope is provided.

(*b*) For other addresses, see the advertisements of tours, steamship lines, and other agencies in the *New York Sunday Times*.

b. Other Colored Prints

The National Child Welfare Association publishes a series of fairy-tale pictures in color, size 22 × 28 inches, and sells them at $3 each, postpaid. They are very attractive for kindergarten and first and second grades. *Snow White, Jack and the Beanstalk, The Three Bears*, and *Little Red Riding Hood* are especially good.

Popular Modern Prints by such illustrators as Maxfield Parrish, Jessie Wilcox Smith, W. L. Taylor, and others, large enough for wall decorations, may be purchased from Edward Gross & Company or Curtis & Cameron. Most of these prints have been published in magazines. There is no special choice to be recommended.

Illustrations made for books, by Willy Pogany, Howard Pyle, and others are now occasionally printed in larger size and may be obtained from the publishers. Investigate.

Occasionally a paper or magazine gets out a large colored supplement picture which is most artistic and interesting in quality and suitable for use in schools. Some of the magazines for women have pictures large enough for friezes though not for individual framing.

c. Wall-Paper Posters

Large wall-paper posters or sections of friezes in most charming colors and attractive subjects, planned for nurseries or mural decorations, are worth investigation if one is in a city. They cost from twenty-five cents to one dollar at the large wall-paper shops and department stores. They tear easily and require careful handling and quick mounting.

d. Silhouette Pictures

Silhouette pictures (black and white), reproductions from cuttings by real artists, are charming and often suggest to children the cutting out of silhouettes for themselves. Obtain from The Tudor Art Shop, from Edward Gross and from Rudolf Lesch.

e. Chinese and Japanese Prints

Oriental pictures and prints are treasures; they can often be picked up at dealers' places for a small sum — twenty-five cents to three dollars. Oriental shops are listed in the Appendix.

f. Colored Reproductions of Famous Paintings

Many firms and museums now publish beautiful colored reproductions in various processes of great masterpieces and well-known modern pictures. They range in size to 30×54 inches from 14×16 inches, and cost from $2 to $75. Some are strong enough in color for use in the school. In choosing reproductions, it is very important to select prints made from original photographs. Those made from photographs of prints instead of from original photographs are always poor in quality. Only reliable firms should be patronized. The best way to purchase such pictures is to select a subject and then consult catalogues before deciding on size and prices, since frequently different firms publish and sell the same pictures.

1. *Sources*

The Chicago Art Institute, The Metropolitan Art Museum and other large galleries have for sale in a number of different sizes and copies, color prints of their original paintings.

The following firms are listed; all issue illustrated catalogues: The Brown Art Studios; The Brown-Robertson Company; the Detroit Publishing Company; A. W. Elson Publishing Company;

Emery School Art Company; the Medici Society; The United States Printing and Lithograph Company.

2. *Selection*

The following reproductions of modern pictures are suitable for any room in the elementary school, as are many others. Prices and sizes quoted are from the United States Printing and Lithograph Company:

Rocks and Sea	Bower	16 × 20	$6.
April the Twentieth	Mazzanovich	16 × 16	8.
The Grand Canal, Venice	J. M. W. Turner		
Autumn Oaks	Inness	11 × 17	2.
Sunset and Splendor	Inness	17 × 28	15.
A Holiday (Children wading in the ocean)	B. Potthast	16 × 20	6.
A New England Harbor	Vincent	16 × 20	6.
Children's Pleasure (Mother and two children in cottage)	B. Potthast	14 × 29	8.
The Lifting Fog (Ships)	H. A. Vincent	20 × 28	10.
The Flower Market (Dutch)	F. Van Vreeland	14 × 20	10.
Autumn Gold (Landscape)	G. Wiegand	16 × 12	2.
Song of the Lark	Breton	21 × 16	3.
Joan of Arc	Boutet de Monvel	8 × 20	.75
Wild Heliotrope (Landscape)	Gamble	20 × 30	10.

(*b*) Old favorites for those who still care for this type of picture are as follows. Investigate sizes and prices, for they vary greatly.

The First Step	Millet
Learning to Knit	Millet
Feeding her Birds	Millet
Madam LeBrun and her Daughter	LeBrun
Sistine Madonna	Raphael
Madonna of the Chair	Raphael
The Nativity	Correggio
The Sower	Millet
Nurse and Child	Hale
Boy with Torn Hat	Sully
Children of Charles I	Van Dyck
Baby Stuart	Van Dyck
The Strawberry Girl	Reynolds
Miss Bowles	Reynolds

The Fruit Girls	Murillo
Alice	Chase
The Age of Innocence	Reynolds
The Blue Boy	Gainsborough
Boy with a Rabbit	Raeburn

g. Special Problems

1. *Preparing Advertising Posters*

(*a*) Trim off all advertising or other print and replace the marginal line.

(*b*) Cover any print which cannot be removed with show-card color (opaque water color) or oil paint of the correct shade; this is also a good method of mending torn or discolored pictures of the poster type.

(*c*) Press out creases or folds with a warm iron, and if they show wear, use color as above after the mounting is done.

2. *Mounting Pictures*

Pictures should be mounted on heavy cardboard or composition wall board (p. 77). The work requires care and accurate measuring.

(*a*) Cut the mount about 2 inches wider than the actual picture (margin not considered). Mark where the corners of the picture will go.

(*b*) Cover the back of the picture smoothly and evenly with flour paste (p. 104) and let it stand for a few minutes till the paste sinks a little into the paper. Take care not to let a thin picture become too moist, for it may stretch or tear.

(*c*) Place the picture on the mount, with its corners on the marks, and smooth it carefully, rubbing the wrinkles from the center out, with a clean, soft cloth. On the back of the mount paste a piece of paper of the same size and weight, to prevent warping.

(*d*) Place the mounted picture between two sheets of clean paper and several thicknesses of newspapers. Change all the paper daily, so that moisture will be absorbed (never put newspapers next to the picture, since print comes off), and put the whole under even pressure (p. 278) till it is thoroughly dry — two weeks is the best length of time.

(*e*) Finish with one or two coats of very thin white shellac or with picture varnish (see shellac), or leave plain.

3. *Framing Pictures*

(*a*) Use any soft light-weight wood, such as white wood, white pine, poplar, birch, chestnut, in thin strips, the width of the strips to be determined by the size of the picture. The Newark Public Library uses a $2\frac{3}{4}$-inch strip for framing all the large prints. Others suggest the following scale, which is, of course, approximate:

For pictures from 28–36 × 36–54 = 4–5 inch frame.
" " " 22–28 × 30–36 = 3–4 inch frame.
" " " 15–22 × 20–30 = $2\frac{1}{2}$–3 inch frame.

(*b*) Have the frame close; no margin should show.

(*c*) Glass is not required; a thin coat of white shellac preserves the picture, or it may be left plain.

(*d*) Finish the frame with a flat stain (not varnish) in black or dark brown according to the coloring of the room. Tack the picture on to the frame, placing the tacks about every 4 inches apart.

4. *Hanging Pictures*

(*a*) All pictures should be hung flat against the wall by two even, parallel wires which are attached at the top about 3 inches from each outer edge. A touch of the wall paint or calcimine on the wire makes it almost invisible.

(*b*) The lower edge of the pictures should be not more than 5 feet from the floor or 5 inches above the cases or shelves; and if several pictures are on the same wall their edges should be even.

(*c*) The wall space should be carefully considered and the light should be good. A poorly placed and badly lighted picture is wasted.

(1) A large picture needs space.

(2) A frieze requires a long unbroken stretch of wall.

(3) A picture with vivid color, bold outline and vigorous composition will light up a dark corner.

(4) Delicate colors and designs need good light.

(5) The best light for a picture is from above or from the side; the worst place for a picture is on the window side of the wall.

D. SCHOOL EXHIBITS

KINDS; PURPOSE

Much interesting and valuable material will be found which cannot have a permanent place in the school. Often it is too valuable or too fragile for school ownership, or it may be used so seldom as to make the care of it a burden. Sometimes the storage space is too limited to afford a place for it, and in other instances, it can be obtained for a short time only. Hence for smaller schools and communities the special exhibit is a great asset. Even if it is not possible to have many fine or educational things constantly with the children, if they see such things for a short time they are greatly helped in building standards and getting clear ideas.

School exhibits are of many kinds. There are art exhibits, industrial exhibits, and picture exhibits, with materials of all kinds included; anything is used which will help the children through seeing to understand and appreciate certain things which are basic in their education. The exhibits may come from the children themselves, from local sources, or from museums, organizations, or firms who send out travel exhibits and collections for rent or as loans. They may be for the children alone, but in most cases the community is included in the plan and usually responds.

HELPFUL REFERENCES

Books and pamphlets which give helpful information and advice will be found in the Appendix.

MATERIALS; EQUIPMENT

Prices quoted are approximate. Addresses are listed in the Appendix. The following suggestions are offered:

I. THE SELECTION AND SOURCES OF EXHIBITS

a. Exhibit of Children's Work

Sometimes a group of older children who have been working on a special topic or project produce something well worth showing to the entire school or the parents.

For instance, the sixth or seventh grade has worked out in history a study of feudalism. There are pictures cut from magazines, mounted and labeled, and sketches of their own showing costumes, armor, a courtyard, a moat and other carefully reproduced details, and another sketch showing a craftsmen shop. There are also perhaps some miniature reproductions: a group of good-sized dolls dressed as noble, peasant, and middle-class people; some furniture; a cardboard shield, large enough to show decoration; a coat-of-arms. There are booklets with interesting descriptions of the period — one of each topic or phase — and on the book table a collection of books about the period — story or history.

Or perhaps the fourth grade has been studying paper. The children have made, dyed, and used their own product and assembled samples of all kinds of paper; and they have also worked out a chart showing all the processes of making and dyeing — not only of their own work, but of the commercial products. Details have been carefully and accurately worked out. A period, an industry, or an art stands forth clearly. So others are invited to see the achievement. The fact that it is the work of children has nothing to do with it. The young workers should themselves understand this and judge their own products impersonally.

These exhibits are entirely different from the general exhibits of children's work and should not be confused with them. One exhibit during the year is enough for any one group.

b. The Local Loan Exhibit

1. *From Friends and Parents or Individuals*

Almost every community, no matter where located, will offer many surprises to the investigating school. All sorts of material will come to light. Curios, pieces of old china and silver; a fine old portrait, a carved chair or table; a patchwork quilt of unusual pattern and quilting design; a hand-woven spread, braided or worked rugs, old samplers, baskets; a dress of rich brocade or embroidery, a loom, a spinning wheel; an old print, a rare book, and many other

treasures may come from simple homes; even from a mountain cabin, a city tenement, and other unexpected places.

Usually the material is loaned and demonstrated by the owners with great pleasure. Sometimes things are assembled as a group to show what the neighborhood has which is worth while, and every one is invited to see the exhibit; at other times only the children are present.

(*a*) These borrowed things should be kept for only a short time and handled very carefully. If fragile or valuable, they should be shown only by their owners.

(*b*) Care of the articles and their prompt return to the owners are absolutely necessary if such a plan is to be successful. If people are sure of receiving consideration like this, the teacher, in turn, may be sure of response and help from the owners of whatever is needed.

2. *From Stores, Local and Nearly Local, Firms and Industries*

These will often coöperate with the teacher and send goods of all kinds for the children to see at school, or will assemble the goods at stores and plants for them to see (lumber, furniture, textiles, housekeeping conveniences). There are many possibilities here, and most valuable experiences may come in this way. It is always best to have the exhibits in charge of the owners, who will explain them and be responsible for them. Parents are often interested in coming to these exhibits.

c. Outside Loan or Rent Exhibits

There are now available an increasing number of loan collections which are sent out by firms and societies and educational agencies. They consist more largely of pictures and films than of objects; and are for art purposes rather than for industrial or general illustrative purposes; but available material of the latter kind is increasing in volume, and in order to get it, the teacher should keep in touch with state organizations and the nearest museum, and should also watch for advertisements in bulletins and in school and other magazines.

All such exhibits should be carefully and promptly repacked and returned after use. Always keep the wrappings in which the articles come, and when unpacking note carefully how each is packed. If there are many articles, a list will be helpful. Such material is sent out on guarantee of quick return and borrowers or

renters will be required to pay for any damage that they are responsible for.

Before ordering or requesting an exhibit, always write for definite information — cost, terms, guarantee, time limit, method of shipping, since conditions and terms may change in a short period.

The following possibilities are worth investigation:

1. The Metropolitan Art Museum of New York has for rent exhibits of textiles, casts, reproductions of coins, and other real objects; also exhibits of original paintings and reproductions, photographs, etchings, color prints, and postcards.

2. The Chicago Art Institute sends out exhibits of postcards, photographs, colored prints.

3. The American Federation of Arts has for rent many exhibits including original works, reproductions, arts and crafts, industrial art, and architecture; and the selection is growing in scope each year. The exhibits are selected from museums, art galleries, print dealers and from the artists themselves, and present a truly wonderful educational and cultural opportunity. The exhibits are rented for from $10 to $200. Investigate for details.

4. The Allanstand Cottage Industries will send out an interesting exhibit of work done by the North Carolina mountaineers, including baskets, hand-woven cloth, counterpanes, toys, and other primitive craft work, if the material is put on sale or if a sufficient rental is paid to cover the trouble of sending it out. Send a stamped envelope for a folder.

5. The Elson Art Publication Company will send a picture exhibit under the same conditions as those named above.

6. For Firms dealing in textiles, pottery, and other art materials, consult the advertisements in any number of the *School Arts Magazine* or *The House Beautiful*, or some other art magazine, and write for information concerning the special material which the children should see, asking for arrangements and terms (if any) upon which the firm will send out such material for exhibit.

7. The Bureau of Forestry will send, free of charge except for postage, an exhibit of commercial woods.

II. SPECIAL PROBLEMS

a. Planning an Exhibit

The planning of these exhibits is important. Much depends

upon their purpose, their size, their scope, and upon the group or groups who will see them.

1. *Place*

When the community is invited, a special room must be set aside. When the children alone are to see the exhibit, a hall or a classroom will do. Light and air are imperative in all cases. If the materials come from outside, they must be made secure against vandals, especially at night; this is very important.

2. *Arrangement*

In arranging them, special care must be taken in grouping and also in sequence — if that is called for. The general rules already given for museum collections hold good. If the wall space is limited, screens will serve well for holding flat things. Extra tables (see trestle tables) are brought up, and boards are placed on tops of desks to give other table space. Open and drop shelves are helpful. Breakable or perishable things should always rest on a steady base, and should be out of reach of hands though not of eyes. There should be plenty of space for moving around, and care should be taken that nothing is in front of the objects. Clear labeling is essential.

3. *Time*

The time for most exhibits should be short. If the exhibit takes place in a classroom, one day is usually enough. If a hall is used, the time may be two or three days, or even a week, especially if the exhibit consists of pictures. It is a good plan to keep the show open after school hours, particularly when the time is limited.

4. *Attendant*

Some responsible person to explain the material and see that all goes well, should be in charge when visitors are present. The children should feel their personal care and responsibility for all outside material, whatever the source.

5. *Outside Aid*

The Parent-Teachers Association will often coöperate with the school in bringing in outside exhibits of all kinds, and will also help to conduct an exhibit, and to repack and ship, thus relieving the teacher of much responsibility. In some cases a small fee may be

charged at the door; this will meet any extra expense or will help purchase material for permanent collections.

b. Using the Exhibit

The children's use of the temporary exhibit differs somewhat from their use of the school museum, since they can spend less time over it and be less free with it.

1. *Before the Exhibit*

If they are to make any real use of such opportunities, they must always be prepared beforehand for what they are to see and what they are to look for in it.

2. *At the Exhibit*

They should go in small groups or as individuals, and should be allowed all the time possible. Hurry is always bad; it is far better to go slowly and see a few things well than to rush over a great deal of ground and come away with only a sense of confusion, as so often happens. The children should be allowed to ask questions freely while looking at things. Of course some one who knows must be on hand to answer questions.

3. *After the Exhibit*

Afterward, in the classroom, while the interest and impressions are still fresh, there should always be a free discussion of the different impressions. The teacher calls attention to special points and makes sure that each experience has really meant something. If possible two visits should be allowed, the discussion taking place between them.

PART TWO

GENERAL SCHOOL EQUIPMENT AND PRACTICAL PROBLEMS

CHAPTER SEVEN

MISCELLANEOUS EQUIPMENT

TIME SAVERS; CONVENIENCES; SPECIAL EQUIPMENT FOR SANITATION AND HEALTH

No one to-day expects a worker of any kind to do his best without the tools and conveniences and time savers which are needed for doing and for simplifying the tasks required of him. The farmer must have his tractor and the latest model in plows, or he cannot compete with his neighbor; the merchant and business man finds the cash register, the typewriter, the adding machine, and many a smaller device absolutely necessary; while a housewife's problems are greatly simplified by the vacuum cleaner, the washing machine, and the electric iron, not to speak of the meat chopper, the egg beater, and countless other minor devices.

The school needs conveniences and time savers quite as much as does the industrial world or the home. The overburdened teacher should be provided with whatever will relieve the mechanical drudgery of teaching and set strength and effort free to be expended where most needed — directly on the children. Moreover, the children themselves profit by the use of short-cuts and certain aids. The duplicator and the paper cutter, like the vacuum cleaner, the tractor, and the adding machine, save time and effort, while the typewriter means almost as much in a progressive school as in a business office. A stepladder and school stationery are among other items that are of great help.

Again, the laws of sanitation and health must be regarded. The general observance of these laws is, of course, a funda-

mental part of the school's existence, but if there is to be real efficiency and order, some special equipment is needed for taking care of illness, meeting emergencies, and providing for lunches, cleaning, and other matters.

The material now to be described has been tested and found helpful by many school people. Much of it has educative as well as practical value, is absolutely essential to good school work and should be added to the equipment as rapidly as possible. Each school, of course, decides what it can use best, and on the order of purchase. All prices quoted are approximate. Addresses are listed in the Appendix. The following subdivisions are treated: I. Health and Sanitation Aids; II. Mechanical Devices; III. Miscellaneous Items.

I. HEALTH AND SANITATION AIDS

In addition to numerous suggestions elsewhere in regard to proper lighting and ventilation, type of reading material, seating, and general nerve conservation, the following suggestions as to special equipment worth knowing about are given.

a. Cleaning Equipment

1. *Doormat and Shoe-Scraper*

(*a*) The cocoa brush mat is probably the best kind for cleaning shoes, though it is harder to keep clean than a braided cocoa mat. A medium size is best.

(*b*) A flexible steel mat outside the front door is best for scraping shoes. The shoe-scraper which is fastened to the edge of the steps is more or less dangerous.

**2. Children's Work Equipment*

Cleaning up after work and keeping things neat and tidy is an important school activity. The following equipment is needed in each room; most of the things will be given by parents from home supplies.

(*a*) Two dust pans (ten cent store) at 10 cents each, or with long handles (hardware or department store) about 35 cents each.

(*b*) Two whisk brooms (old ones from home, or new ones at about 20 cents each) for brushing off desks, tables or window shelves and sills.

(*c*) Two hearth brooms (from the grocer's at 15 cents each) for brushing up trash from the floor.

(*d*) Two small scrubbing brushes (from the ten cent store at 5 cents each) for cleaning aquariums, vases, sinks, and basins.

(*e*) One small mop, trimmed close, for use with water or clay on the floor.

(*f*) Two or four small granite basins (from the ten cent store, 10 cents) for washing hands and for washing the spots off desks and clothes.

(*g*) Two small washboards (toy or boudoir size; ten cent store, department store, mail-order house, at 10 to 15 cents each).

(*h*) One galvanized foot tub (50 cents) for washing large things, etc.

(*i*) Cloths (from home) for dusting and cleaning. A bag of excelsior for cleaning up clay, paint, and other spots.

(*j*) One quart bottle of kerosene (from home) for cleaning paint spots on clothes, floor, and hands.

(*k*) One quart bottle of benzine or gasoline (from home) for cleaning the printing outfit and block prints.

3. *For School Use*

State and government publications give full directions for cleaning buildings and suggest the needed equipment.

*4. *Trash Receptacles*

Containers for trash are needed in the school grounds, in the halls, and in every classroom.

(*a*) Outdoor receptacles of solid construction and with close-fitting tops must be used. They must be kept covered.

(1) Solar Self-Closing Receptacles are most convenient. They cost from $5.50 to $9.50; 24 inches is a good size and costs about $6, gray or green finish. These are bought from mail-order houses, and from Hammett and other school-supply houses.

(2) Largest size galvanized garbage cans with tops, painted green or brown, will serve every purpose; these cost about $2.

(3) Barrels or large kegs with tops made to fit, painted brown or green, will also make satisfactory containers.

(4) Chicken wire tacked on a frame makes an inexpensive and satisfactory receptacle for papers.

(*b*) Indoor receptacles are of several kinds.

(1) Barrels, cans, or boxes, painted good colors, always with close-fitting tops, are suitable for use in halls.

(2) Wastebaskets are required in each room. They should be large and durable, of good shape and color, and so closely made that small trash will not "leak out." Flimsy cardboard or cloth-covered baskets should never be used; they are both unsanitary and inartistic. Wire baskets are ugly and unsatisfactory.

Willow baskets are the prettiest and best. They are expensive when purchased but may be made by the older children of willow rods. They are attractive in natural color or stained in soft or gay colors.

Splint baskets are durable and attractive and may be made in any size, color, or shape, by older children.

Corrugated steel baskets ($1.50), brown and green finish; copper-colored fiber baskets ($2.25) and rattan baskets ($1.50) from Hammett's or other supply-house or mail-order house, will give satisfactory service.

(3) Strong, heavy cartons covered with wall paper and shellacked will give temporary service. Discard when torn, marked, or soiled.

(4) A smooth, well-made wooden box, with handles attached, painted to match the woodwork will serve.

(5) A lard or garbage can of tin, painted to tone with the room may be used.

*b.**Emergency and Illness Equipment

Some method and means of taking care of sick or injured children are needed in every school. The sick child should be isolated at once from the others. For this purpose a small room connecting with the principal's office is best — where there is no special in-

firmary — but the office itself can be used or even a part of the hall, screened off.

In a rural school where the children remain all day, the smaller ones should, and the tiny ones must, have a nap or a rest — out-of-doors if possible.

1. *A Place to Lie Down*

A place for lying down is essential.

(*a*) Folding canvas cots (about $3.50 from any furniture store or mail-order house) are most economical.

(*b*) Built-in boxes (p. 333) or seats or rolling boxes (p. 334) may be used. Some schools use a box (with a hinged top) containing a blanket, a mattress and other requirements. Such a box should be mounted on casters and in order to give the best service should be narrow enough to roll through doors.

(*c*) The floor, with a blanket, a rag rug or a thick pad of newspapers may be used when the weather is not too cold.

(*d*) Folding canvas chairs (p. 300) with foot-rests (about $2.50 from mail-order houses) are often used.

(*e*) Blankets or quilts of dark color (army blankets are best) and pillows are needed.

(*f*) A canvas folding cot, several folding canvas lawn chairs with foot rests, two or three wash blankets of dark color (army or cotton), two pillows (one small; one large and firm for support), and some rag rugs are desirable equipment in any school.

2. *First-Aid Books*

A first-aid book (from the American Red Cross, the Woman's Edition) at a low price, should be in every room.

3. *First-Aid Kits or Cabinets*

First-aid kits or cabinets are also required. These are made to comply with state requirements and for different sized schools by Bauer & Black and by Johnson & Johnson, and are sold by drug stores and school-supply houses at $1 to $5. A booklet with some directions and help in first-aid treatment accompanies each cabinet.

These cabinets may also be assembled by teacher from state specification for the ready-made kits. Iodine, adhesive tape, absorbent cotton, and bandages of several kinds are essential requirements.

c. Equipment for Physical Tests and Measures

1. *For Eyes and Ears*

All children who show any signs of defective sight or hearing should be immediately tested by the school nurse, doctor, or teacher and any marked defects should be reported to parents with advice that there be further examination. Inattention, strained attention, slow response to directions, marked watching of the teacher's lips, inability to read, apparent stupidity, holding books or objects close to the eyes — any of these things may easily signify that the child cannot see or hear well.

For exact directions for making and recording these tests, see pamphlet (price 10 cents) *Health Essentials for Rural School Children*, Dr. Thomas D. Wood.

*(*a*) Test eyes with Snellen Charts. Obtain these charts from State Health or Education Department or from supply houses for schools — free or for less than 50 cents each, or from the Bureau of Education, Washington, D.C., for 5 cents.

(*b*) Test ears with:

(1) Politzer's Acoumeter — $5. This can be had from any surgical supply company or local drug store; or a doctor will order it. This is most reliable. Directions accompany this.

(2) Standard whisper; used by doctors but not sure to give laymen such accurate results.

(3) Directions to the child; with his back turned to the tester ask him to do some unaccustomed thing. This is a fair test for young children.

(4) No. 4A. Audimeter, Graybar Electric Company, $550. This machine makes it possible to test 40 children at one time and about 400 children in one day with absolute accuracy. Investigate.

*2. *For Weighing and Measuring*

Scales and measures are needed in every school. Each child should be weighed without shoes or coat regularly once a month (those who are underweight every two weeks) and measured every three months. The records should be carefully kept. The weighing should be done if possible, in the classroom to avoid confusion. Do not make a ceremony or exciting event of weighing the children, nor talk to them about their gain or loss in weight. The gain or

loss is suggestive rather than conclusive, anyway, and in this aspect should be discussed with parents and physicians.

(*a*) Fairbanks or Howe scales are absolutely reliable, carry a full guarantee, and cost from $25 up. A satisfactory scale for any school may be had for $25 from Fairbanks. A dark finish is advised, since it does not show soiling. A spring or slot scale should not be used except in very expensive models.

(*b*) A tape measure or yardstick tacked to the wall is used for measuring. A rod on the scales is not advised.

d. Ventilation and Temperature Regulators

1. *Ventilation Boards.*

(*a*) A board about 6 to 10 inches high, cut to fit the window opening, helps to ventilate the room and cut off the draft. Raise the window and slip the board under the sash.

(*b*) Window boxes often serve the same purpose if the window is raised to the top of the box.

*2. *Thermometer*

A thermometer is needed in each room. It is used to keep the temperature of the room at the proper degree (65° to 68°), and it is also used for teaching purposes (pp. 4, 35). A large size is desirable for the lower grades — 12 to 14 inches in height.

(*a*) Often an advertising thermometer will be given by a drug store or a hardware concern. The lettering is easily painted out.

(*b*) A good thermometer, 10 to 12 inches, cost $1, to be had from local stores, mail-order houses, and school-supply companies.

e. *Water Equipment

Equipment for drinking, washing, and toilet purposes is fully covered in bulletins from the State Department of Education and the United States Government, and in publications issued by Columbia University; so only a few suggestions are given here. Write for a list of publications, or state your problem and ask for proper material. The *American School Board Journal* carries in its advertising columns many practical suggestions and devices. For washing purposes, low sinks or a wash bench with one basin for each 15 children, paper towels, and liquid or powdered soap are essential.

1. *Towels*

Manila cream tissue towels, size 12 × 18, (from the Andrews Paper Company and other paper dealers), cost about 20 cents a ream if purchased in large quantities and are less expensive than regular towels. A ream should supply one child, perhaps two children, for a year. Punch holes in the towels and hang them near the sink or basins, to be used one or two at a time. This plan for towels has been successfully carried out in Worcester (Mass.) city schools.

2. *Soap*

A liquid soap (not jelly) can be made by dissolving white soap in water. Use in a perfume bottle or a bottle with a hole in the cork; shake the preparation on the hands as needed.

I. MECHANICAL DEVICES

All equipment of this type should be well-made and strong; a cheap machine never pays. If good care is given, such as oiling, and protection (see How to Care for Material, p. 321), the first cost is almost all, and the machine will last for years.

a. *The Duplicator

Some form of duplicator is absolutely necessary in modern school work for making notices, notes, programs, reports, and the many other things of the kind that are required in quantities. It is also invaluable for introducing new and varied reading matter (pp. 144–150), such as special poems and stories, also records, stories, verse, and descriptions made by the children and reproduced so each child may have a copy of his own.

There are two general types of duplicator: the hectograph, which may be purchased or made at low cost in the school, and the mimeograph, a real machine and an expensive item. The selection depends upon the kind of material to be duplicated and the use to which it is to be put, the number of copies that will be required, and the expense of the machine itself.

*1. *Hectograph*

The hectograph is best for small schools, for classroom use, and for general use where 100 copies or fewer are required.

The cost of duplicating is very small and any one can use the

machine, which requires only a special ink (about 40 cents a bottle) for handwork, and special ribbon (75 cents each) for typing. A 12×14-inch size is advised ($8\frac{1}{2} \times 12$ size is the minimum size) with a printing surface of $7\frac{1}{4} \times 11$ inches or larger.

(*a*) *Ready-made hectographs* come in any size — prices from $1.50 to $25 — and in many makes. Every school-supply house carries one. Some duplicators have a slate surface, others use a composition filler; there is little choice between make or material, and so no special recommendations are made. The slate surface is perhaps more convenient; it also costs a little more.

(*b*) A *school-made hectograph* costs only a few cents and does as good work as one that is purchased. It gives from fifty to seventy-five good duplicates of a single copy. A pan $9 \times 12\frac{1}{2}$ inches, two ounces of sheet gelatine, and one pint of glycerine are needed.

(1) To make a hectograph, place glycerine and gelatine in a double boiler and boil slowly for two hours. Pour the mixture into a pan. (Be sure the pan is level.) Let the stuff cool thoroughly from twelve to twenty-four hours before using it. Prick the bubbles with a pin. Remove the foam by passing the edge of a sheet of writing paper over the surface of the mixture.

(2) To make copy, write or letter by hand with black hectograph ink (40 cents per bottle) or type with black hectograph ribbon (75 cents) on white paper that has a smooth surface. All these materials can be had from any supply house or book store.

(3) To print, place the copy face down on the hectograph; smooth it with a cloth; remove it at the end of two minutes. Then put the sheets, one at a time, on the hectograph; smooth carefully and remove them at once.

(4) To clean, wipe the hectograph with a damp cloth or sponge. Use lukewarm water.

2. *Mimeograph*

The mimeograph (standard machine, A. B. Dick Company) is best for use in the office of a large school or school system, where quantities of duplicated material are needed and where a trained typist and operator are possible. Such a machine requires a special stencil made on the typewriter, and is too expensive for small amounts of work and not practical for small schools, though indis-

pensable for larger ones. Purchase direct from makers or from a local office-supply firm. Some school-supply firms, also, handle the mimeograph.

Outside work for which a charge is made is done in some cases; this helps with the expense to the school.

(*a*) The machine costs from $45 to $110 according to size and mechanical improvements. For school purposes the fully equipped machine is not often needed; that kind is planned for business concerns which turn out thousands of copies.

(1) Model 75 prints sheets $7\frac{1}{4} \times 10\frac{1}{4}$ and costs about $45. This model is recommended for the average school.

(2) Model 76 is an older model with the same capacity as 77; it will serve every need of the average school system and costs about $65.

(3) Model 77 has all the newest improvements, prints in large quantities, has a printing surface of $7\frac{1}{4} \times 14$ inches (sheet 9×16) and costs about $110. It is only needed by large city systems.

(*b*) The stencil costs $3.50 to $4 per box of sheets.

(*c*) The ink costs $2.50 per one-pound can. One pound prints from 14 to 25 thousand full sheets (letter-size), according to the kind of paper used.

(*d*) Mimeograph paper costs 60 cents to $1 a ream at any paper or supply house. Any cheap paper may be used.

3. *Office Printing Sets*

The office printing set consists of a set of rubber type (5 each of capitals; 6–12 each of small letters; figures and signs), a four-inch holder, and a pad, and comes with full directions.

These sets are used for printing spelling lists, dictionaries, labels, invitations, notices, short reading lessons for small children. Where a typewriter or a duplicator is not available the outfit is helpful in duplicating many things. The older children use it freely and gain experience in composition, spelling, and punctuation. The work is slow, and all teachers do not find it practical.

(*a*) The sets come in several sizes, and cost from $1.25 to $4.20 according to size and the number of small letters. They are handled by mail-order houses, print-supply houses, and specialty concerns.

(1) Set 217B — at $4.20 has large clear type and 12 each of the small letters; from the Fulton Specialty Company.

(2) Set No. 3R 16116 — at $1.25 from Sears Roebuck Company. Baumgartner also has these outfits.

(*b*) The following directions are given:

(1) To print: ink the type well, and press the type holder evenly and firmly on the paper; a block or strip of wood larger than the holder and placed on top of this when printing will help distribute the pressure. Two children work together; one of them finds and replaces the letters, the other prints. Practice is needed for good work.

(2) To keep: always return the type to the right section of the case immediately after using it. Type is easily lost and the sets can quickly become useless.

b. Paper Cutter

A good paper cutter is an essential. With it, paper booklet covers and sheets, pictures and mounts, blotters, calendar backs, and cards for invitations for Easter and Christmas greetings and for block printing as well as many other needs, can be quickly and accurately trimmed or cut in any size or shape, by the teacher or the older children. The younger children should not use the paper cutter, since they might seriously injure themselves with it.

There are many sizes and kinds of paper cutter, each serving a special need, and prices vary greatly. The smaller and cheaper cutters are called by manufacturers card cutters; the larger, stronger ones paper cutters.

1. *Card Cutters*

For classroom use where the cutting is not done in large amounts, a card cutter (12-inch blade) will serve for a time if the user does not try to cut too many sheets at once.

Nearly every school supply and library house carries these card cutters. The prices for the same make vary greatly, and so each purchaser should examine the price list of the nearest dealer — noting also the mailing weight and charge, for all cutters are heavy. Do not invest more than $10 in a card cutter.

The following card cutters give fair service for a time:

The Monarch — 12-inch blade — weight 6 pounds.	About $4.50–6
The Popular — 15-inch blade — weight 18 pounds.	About $10–12
The Dandy — 12-inch blade — weight 12 pounds.	About $8–10

*2. *Paper Cutter*

A strong paper cutter is required for general use and in the end is cheaper. It will cut not only paper but cloth, thin metal, leather, and thin wood, and is recommended for use where possible. These strong paper cutters are handled by press concerns and regular machine makers; a good, reliable cutter with a blade 12 to 24 inches in length costs about $20.

The following cutters are standard and carry a satisfactory guarantee by reliable firms. Transportation is extra.

(*a*) The Eagle Card and Paper Cutter is very strong, has a 24-inch blade, iron bed, and cuts cloth, thin wood, thin metal, and leather, as well as paper and cardboard. It weighs 50 pounds and is an excellent purchase at about $18 (no discount) from the Kelsey Press.

(*b*) The Boston Cutter also cuts the above material; it comes in two sizes and is a popular make.

No. 12 has a $12\frac{1}{4}$-inch blade, weighs 25 pounds, and costs $20
No. 16 has a $16\frac{1}{4}$-inch blade, weighs 40 pounds, and costs $24

(*c*) The Pearl Cutter is a real machine and cuts through 2 inches of stock at one operation. This would be a good purchase for a large county or city system where much cutting is done and much material handled. No. 14 (without base) weighs 200 pounds, has a $14\frac{1}{2}$-inch blade, and costs $75. Both cutters come from the Golding Manufacturing Company. With the Boston and Pearl cutters there is 2% discount for cash.

c. *Pencil Sharpeners

A pencil sharpener is a necessity for every schoolroom. A good one with cutters costs about $5 or $6; many are cheaper. All supply houses carry pencil sharpeners in stock. No special make is advised.

d. Printing Outfits

Printing outfits are of two kinds, the large rubber stamp letters in sizes from 2 inches to $\frac{1}{2}$ inch, and the small office sets of regular rubber type with four-line type holders. The office sets have already been noted (p. 272). Each kind has an important place and many uses in an up-to-date school.

*1. *Chart or Sign Makers: Rubber Stamp Outfits*

These outfits have a complete set of capital and small letters, numbers and signs, and punctuation marks. They come in several sizes and are used for making charts, posters, signs, labels on book covers, and pictures. Reading material (pp. 145–150) for younger children, such as charts, records of their experiences, cut-up stories, poems, drill cards, and word builders, are easily and quickly made with these outfits and are much more satisfactory, as well as cheaper, than ready-made ones. Any make will serve; the sizes and prices are the most important point.

(*a*) The outfits are carried by all school-supply houses in some one size, and also by the S. Baumgartner Company and the Fulton Specialty Company, Elizabeth, New Jersey. Go shopping for the desired size, since prices vary. "Junior Chart Markers" come from the Fulton Specialty Company and cost about $14 a dozen.

(*b*) A large school should have all three of the following sizes. If only one can be afforded, the $1\frac{1}{4}$-inch size should be chosen — the one-inch size being the smallest for general use. The half-inch size "Junior Chart Marker" is suggested for use with children. Each primary room should have from two to six of these and there should be at least one in each upper room.

(1) A two-inch or one-and-a-half inch letter (capital) is needed for material to be seen at a distance, that is, all over the room or the hall, and costs $6.50 to $10.

(2) A one-inch or seven-eighths-inch size will be correct for reading charts, where children gather close to the material, and costs $3.75 to $4.50.

*(3) A one-half-inch size is good for lettering books and covers, and for making cut-out stories, lists, and labels. It costs $2 to $3.75.

2. *Substitute Pens*

Lettering pens make an inexpensive substitute (8 and 15 cents each) for the stamp outfit. Many teachers prefer to print by hand. After a little practice the work is done very rapidly. A lettering pen (Esterbrook) comes in several sizes, the size to be used depending upon the height of the letters to be made. No. 3 is for an average, No. 5 for an extra wide line. A rubber pen (spoon-billed) may also be used. The Esterbrook Pen Company also has an excellent broad edge pen for manuscript writing in six widths. A card of these will prove most satisfactory for the above work.

e. Punch

A punch for making holes in leaflets or booklets and construction materials should be in every school. It should be strong and simply made for punching thick paper, leather, and tin

*1. *Conductor Punch*

A "conductor punch" is needed in every classroom for hand work. This costs from twenty-five to fifty cents at any school-supply house. A stronger punch — "The Favorite" — costs $2 (Hammett).

2. *Eyelet Punch*

An eyelet punch is convenient to have in both office and schoolroom. It costs about $1.50 at any supply house. The Solidhed Eyelet is a good punch.

*3. *Combination Punch*

The Challenge Eyelet Press No. 1 (strongly recommended) is a combination machine which fastens from 50 to 75 sheets of paper together, unfastens them easily, makes regulation eyelets in paper, cloth, and cardboard, and punches holes in all materials and in thin metal. Cost, $10, weight 5 lbs. The press is small and convenient and is an excellent investment for any school. The eyelets cost $1 a thousand.

4. *Two-Hole Punch*

The Hummer Adjustable Punch (Hammett) makes two holes through 12 to 15 sheets, of several sizes and at different distances apart; it is excellent for booklets and pictures, and costs $7.50.

*5. *Awl*

An awl — for making large holes — from any hardware store, is also needed.

f. Typewriter

The typewriter is no longer the exclusive property of the business office; progressive teachers are finding it of growing use for school purposes.

1. *Large-Type Machine*

A Great Primer type machine is widely used for making special reading material (pp. 147–148). Copies of poems, stories,

original work by the children, records of experiences and excursions, as well as other desired material are thus made possible. When these copies are duplicated in fairly large numbers each child can have his own copy. Such a machine gives the clear legible type that is so desirable all through the elementary period, especially in the first four grades, where eye strain is great and the mechanical details of reading are still a problem. The regular type is too small for this kind of work. The machine should be used only by an adult, never by children. Good, clear workmanship is all important.

The cost of such a machine puts it in the luxury class for small schools; but it should have a place in the office of every county or city school. The Underwood machine is recommended especially by schools which have experimented with various makes. Remington also makes this kind of machine. With all discounts, the price to schools is about $85. This large type may also be placed on regulation machines for about $20. Consult dealers, who have agents in all cities.

*2. *Regulation Type Machine*

A regulation type machine is a valuable aid in every schoolroom. The teacher finds it most serviceable, it can be freely used by the children for writing stories and poems, themes, spelling lists, and labels, and it has proved very helpful in teaching composition, spelling, and reading and in developing interest in these subjects. The cost need not be great, since a second-hand machine will serve. Rebuilt machines of good firms give excellent service. Large type may be substituted, as suggested above.

III. MISCELLANEOUS HELPS

Other equipment of various kinds is of practical value in making work easier and simple.

a. Blackboard Tools and Conveniences

The following tools and conveniences are often desirable:

1. *Blackboard Compass*

A blackboard compass with rubber foot and adjustable crayon holder, 17 inches in length, and with screw adjustment at the top, costs 90 cents from the Chicago Apparatus Company; also from school-supply houses. For older children only.

2. *Pointer*

A pointer can be had for 25 or 35 cents from any school-supply house.

*3. *Ruler*

A 3-foot ruler, metal edged, with a handle costs about 75 cents from any supply house. An ordinary yardstick which costs about 35 cents or one made by the children will also serve.

4. *Eraser Cleaners*

Eraser cleaners of two kinds seem to be giving good service; either kind can be purchased from any school-supply company.

(*a*) Haynes Electric Vacuum Cleaner with bag, $32.50, for large schools.

(*b*) The New Sanitary Eraser Cleaner (hand) costs $9 and will serve the ordinary school.

*5. *Rack*

A movable wire rack or holder to be used in the chalk tray for keeping crayons and erasers out of the dust is very desirable. This can be obtained from the firms which supply blackboards and blackboard fixtures. Investigate.

b. Boards for Desks

Short desk boards of white pine, poplar, or other soft wood, cut to fit the desk, make long tables for exhibits or for dinners or can be used for other purposes (p. 117). They are water-stained a soft gray or brown color or are left plain — never painted or varnished. When they are not in use keep them in a cupboard or a box.

**c.* Boards for Pressing Pasted or Glued Work

Two heavy boards of well-seasoned lumber, each 1 inch thick, 40 to 52 inches long and 40 inches wide, will be very serviceable for pressing papers, pictures, booklets, and all pasted things. Smaller boards may be used, but this size will take care of the largest pieces and posters as well as the smaller ones, and it will press a number of things at once. The heavy boards are best because they do not warp or split under heavy pressure.

The boards should be carefully smoothed and polished on the inside, not painted, and are held together by two to four clamps (5 or 6 inch opening). If the clamps are kept attached to one board they will not get lost.

d. Calendar

A large, clearly printed calendar is needed (p. 34) in each classroom. It may be mounted on heavy paper or fastened to the bulletin board or the wall, but not placed on the blackboard. A hand-printed or an advertising calendar sheet may be used.

e. Card Catalogue

A card catalogue system for teacher, grade, and school as a whole, is most valuable. Once organized, it will not be abandoned for other plan of keeping records and such material. Careful filing in strict alphabetical order is essential.

1. *Cards*

The size of the card varies — 3×5 inches is a small, convenient size for records, with 4×6 inches, 5×8 inches, or larger for a note list. The cards can be cut quickly by the teacher with the paper cutter, or purchased from a book store or from a local printer. The index, or guide, card should be fairly stiff — the others of ordinary tablet paper, usually with lines. Temporary notes can be written on scraps of any size and entered later, if they are to be used, on cards.

2. *Arrangement*

The cards are kept in an upright position in a desk drawer or in a box which is about an inch wider than the cards, one inch or more lower, and long enough to allow the cards to slant and move freely. The boxes can be constructed of cardboard or wood, or ready-made boxes can be cut to the required proportions and painted or covered with paper or cloth. (See Filing Cases, p. 333.)

3. *Uses*

The teacher needs three sets of cards, kept separately:

(*a*) For children's records an index card is made out for each individual. It bears the child's name, age, address, a list of contagious diseases he has had, and other necessary information. Behind this card, the teacher drops any notes on this child's work, disposition, qualities, physical condition, home conditions, etc., which may help her in understanding and handling him and in grading his work. Where there are large groups of children, this method is of valuable help to teachers and principal.

(*b*) For equipment, materials, an index card is made out for

each item, such as paper, tools, pictures, readers, constructive supplies and so on. Behind these cards are lists of each, quantities ordered, prices and notes as to frequency of use and value to children. Reference to these lists will help in ordering and using material equipment and in deciding what to discard.

(*c*) For school work and plans, an index card for each topic or subject, with clippings, notes, and suggestions placed behind, is a useful plan. Sometimes envelopes are used instead of cards, and filed in the same way; any convenient size will do. This index card plan for school work takes the place of the usual teacher's notebook.

f. *Clock

1. *Regulation Clock*

A central clock is needed in the hall or office, and also a clock in every classroom. Mail-order houses seem to offer the best values and styles. $7 to $10. Investigate.

(*a*) The clock should be as large as possible — a wall clock is best. For use with little children a clock with a visible pendulum is desirable.

(*b*) The case should be plain; no trimming or carving.

(*c*) The color should harmonize with the woodwork of the room. If the clock comes finished in golden oak remove the varnish with sand paper and stain or paint a suitable flat color. Be careful *not* to get paint in the mechanism of the clock.

2. *Electric Clock*

An electric clock system is expensive, but it is most important for large schools. Investigate the Standard Electric Clock Company's plans and prices.

g. Flashlight

A flashlight (mail-order houses have all sizes and prices) is a great help for use in dark cupboards and closets.

h. Handy Box

A handy box is a great convenience in each room. These boxes may be purchased (Dennison's $1.50 to $3) or assembled by the teacher to meet special needs. The following list of contents is suggested: thumbtacks, brass-headed tacks, carpet tacks, pins, paper-

fasteners, clips, string, brown gummed tape, gummed cloth labels, transparent mending paper, paint brush, tubes of water-color paint, tube cement, paste and glue, scissors, picture wire, pencil, pen, marking crayon, chalk. These articles are placed in small open boxes which are fitted into a larger box with a cover, or are put in a box or a desk drawer which is divided into separate compartments (p. 335) for each item.

i. Hand Axe or Hatchet

This is greatly needed for outdoor work. It is used for work in the garden, for splitting kindling, cutting nature materials — branches of trees, twigs, and splints for baskets — and for many other purposes.

j. Irons and Ironing Boards

1. *Irons*

Irons (electric preferred) in two sizes, 3 to 5 pounds, are needed for pressing or ironing all kinds of things, such as paper, costumes, curtains, towels, doll clothes, covers. The electric irons cost $3 or $4. An outlet with colored warning bulbs is often required by insurance laws. If there is a place for heating old-fashioned sad irons, they will often be given by parents.

2. *Ironing Boards*

An ironing board (folding preferred) may or may not be a convenience, according to the amount of available space. Ironing boards can be purchased or made with or without stand.

The floor can be used, or unpainted boards or table tops. Be careful never to use an iron on a painted or varnished surface.

(*a*) A small board, 3 feet × 8 inches, and three quarters inch thick will serve for ironing little pieces. Child size or toy boards (folding) can be obtained from any toy store, mail-order house or from Natural Washboard Company. Investigate prices.

(*b*) A larger board, 4 feet × 12 inches, and three quarters inch thick, is a practical school size.

k. Mirror

A mirror, 12 × 18 inches or larger, of good plate glass is needed. Hang it low enough for use by all the children in the coat room, the lavatory, the teacher's office, or behind a screen in the classroom.

l. Rugs and Mats

These are especially desirable for the primary grades where the children work on the floor. They also add to the appearance and comfort of any room.

*1. *Rugs*

Rag (from scraps brought and sewed, and sometimes woven, by the children) or linoleum rugs are best. The rag rugs may be of bright colors, the linoleum plain or with small tile design. Both should be washed often.

*2. *Mats*

Small mats for individual children are made of squares of linoleum, rag, or straw. They are used for floor work or sitting outdoors, and are kept in the closet when not in use.

m. School Stationery

School letterhead stationery is strongly recommended and should be used for all school business letters. It gives validity to the letter and is very helpful in getting quick response to orders and to requests for information, samples, and free material.

1. *Kinds; Prices*

This stationery should be of medium grade of bond, which costs about $1.50 to $2 per 1000 sheets, $2 to $2.50 per 1000 envelopes; in two sizes — full ($8\frac{1}{2} \times 11$) and half sheets ($8\frac{1}{2} \times 5\frac{1}{2}$); with the names of the school, and the principal, and the address, all printed in black or dark blue (at about $2 per 1000). The schools of a county could use the county stationery with the name of the school added.

2. *Amount; Source*

(*a*) For a small school of one to four teachers, 1000 envelopes, 1000 sheets of printed paper, and 1000 sheets of plain paper for second sheets, is a good supply, though a larger order is always cheaper.

(*b*) This may be ordered from local printers or, after prices are investigated, from some printing concern. Write to Hammett's and the Kelsey Press for prices and samples of paper and letterheads. Care should be taken to give the exact size and quality of the paper wanted, also a specimen of the form and type of the desired letterhead.

3. *Use: Care*

(*a*) School stationery should be used with economy. The text of letter should be carefully planned before the paper is used; this applies to both teachers and children. The paper should never be employed for personal matters.

(*b*) School stationery should be kept in suitable covered boxes, the paper and envelopes separate, and taken out carefully for use. Paper is easily damaged, but if properly cared for it will last a long time. If possible, it should be kept in the office and given out as needed; this plan avoids waste and carelessness.

**n.* Stepladders

1. *Ladder*

A stepladder, strong, of medium weight and steady, tall enough for hanging pictures, curtains, and shades in class and assembly rooms and for washing windows, is essential. Prices vary. A cheap soft wood ladder is dangerous. Measure for a special building as the height of ceilings and windows differs with different buildings.

2. *Chair Combination*

A chair which opens into a low stepladder is a convenience. It is used as a seat and is high enough for reaching shelves, some pictures and for other uses by the children. It comes from any hardware store or mail-order house at about $4.

3. *Stool*

A low, strong stool, so heavy at the base that it will not tip, is also needed for use in closets or in the classroom.

o. Stove and Utensils

1. *Stove*

A small movable stove (oil, electric, gas), 2 burners preferred, from mail-order houses or local stores, is greatly needed in every school. There should be one in every room, if possible. The stove is used for heating water, dyeing, making paste, dipping candles and many other things, or for cooking a hot dish for the children.

2. *Oven*

A separate oven is a great convenience. One will serve the

entire school for such occasional needs as baking cookies or bread or preparing baked dishes. These ovens cost from $1.50 to $5 according to size and quality, from local stores or mail-order firms.

(*a*) A small oven about 12 inches all dimensions, costs $1.50 from a mail-order firm.

(*b*) A larger size, 20 × 14 × 18 inches, costs about $4 from the same source.

*3. *Utensils*

A large kettle (3 gallons), and double boilers (1-quart and 3-quart) are advised, but a 3-quart double boiler will serve. Other vessels may be borrowed from parents when needed.

For fuller suggestions see Cooking Outfit (p. 129).

CHAPTER EIGHT

BASIC EQUIPMENT

FURNITURE; FIXTURES; SPECIAL FEATURES

KINDS

Selecting suitable basic equipment for the modern elementary school is an important problem, of which furniture proper is but one phase. Not only must there be seating facilities, tables, chairs and other regulation furniture, but there must be the many different fixtures and accessories which will prove most valuable factors in good teaching.

Some of this varied equipment belongs to the architect's field, other plans are too complicated for adoption except under expert direction; but there is much which is possible, under good management, for use or application in any school.

METHODS OF OBTAINING EQUIPMENT

Some things may be purchased ready made. This may be the most expensive though often the most satisfactory plan. On the other hand, many things which will serve as well, or better, and cost less can be made locally. Old equipment already on hand may also be adapted or made over. Great care is needed in deciding which is best; judgment, forethought, and common sense are the only reliable guides.

Obviously the cost in both time and money must be carefully worked out. The time spent on a "job" may easily be out of all proportion to the finished object. The money spent for material and work sometimes creeps up to a sum which would have purchased a more satisfactory ready-made piece.

The finished product must be usable and suitable for the purpose in mind; therefore size, appearance, and suitability should always be thought of before the decision is made.

PURCHASED EQUIPMENT

Certain kinds of equipment — chairs, desks, slate for blackboard — must be purchased. For these there are no substitutes. Other items, such as tables, bookcases, lockers, and display cases, may be also purchased if desired.

All ready-made equipment should be the best of its kind. It is poor economy to buy things which will fall to pieces or quickly become shabby, shaky, and broken. Strong, well-made furniture with good lines will last indefinitely and can be refinished whenever the outside becomes shabby or the color scheme of the room is changed. Good slate blackboards never need replacement.

SCHOOL-MADE AND ADAPTED EQUIPMENT

Tables, cases, screens, lockers, and many other things are included here. These also should be strong and durable. Finished cabinet making is not required, but rough ugly pieces are not desirable. The finish should be that of the other woodwork and furniture if possible. If not, it should blend well with it. No attempt at decoration should be made; straight, simple lines and correct proportions are best.

Built-in features, such as shelves of all kinds, cupboards, wall cases, boxes, lockers, and bulletin boards, which add greatly to the appearance, convenience, and cleanliness of a room if rightly placed, properly designed and finished, need a special note.

Each built-in feature should be plain in design and should look, and really be, a part of the plan and structure of the room, not an excrescence. To obtain this effect the lines

and general proportions of the room and of such items as openings (doors and windows), blackboards, radiators, floor space, and alcoves or wall depressions, should be taken into consideration. Each piece should be really needed and should also be conveniently placed with regard to its need and use. Thus, the cupboard holding work materials should be close to the work bench and tools, and the box for garden tools should be in the coat room or near the door. In some cases it is wise to make the pieces separately and then fasten them with as few nails as possible to the wall and floor; this is especially a good plan if there is a chance that the pieces may be moved. This plan may be also used with old pieces adapted to new uses.

Making over, changing, or "fixing up" old furniture is often practical and economical, especially where makeshifts are to be used only until better things are possible, or where it is a case of made-overs or something worse. The furniture may be already in the school (as fixed desks), or given from homes (as old tables and chairs), or occasionally may be bought from a second-hand store or at a sale. Sometimes the results are quite as good as new purchases — even better. It all depends upon conditions.

The *material* for making any of this equipment is selected according to its use. A soft wood such as white pine, poplar, or basswood, free from knots, is usually best, particularly if the children are to do part or all of the work, since it is easier to handle and lighter in weight. Local products should be used, where possible, to save freight charges. Dressed lumber should be used for all work in which children have a share, for splinters are dangerous. Where it seems best, a carpenter can handle the undressed material. Specially selected lumber is needed where a stain finish is to be used; paint will cover up many defects. For full discussion see "Paint" (page 90) and "Wood" (page 113). All lum-

ber must be well-seasoned and cured; otherwise warping and cracks will spoil the finished product.

The *making* or *adopting* of this equipment is done in various ways. The work may be done by a local carpenter, or by older children of the school under direction. Sometimes parents or friends will help. In some systems much of the needed equipment is made by the manual training department in regular or in summer terms. A regular shop with a carpenter in charge is another plan.

Where a temporary workman is employed, the most satisfactory plan, usually, is to furnish all materials (good quality is then assured) and pay by the day or the hour for the work. The teacher should watch the work closely as it goes on, in order to correct errors or modify plans, as it is often advisable to do.

PROBLEMS IN SELECTING EQUIPMENT

Many of these problems are in the transition state, with experts and authorities differing on almost every item, as a recent study (*School Furniture*, A. C. Ritchie [1]) shows. The fact, however, that much earnest experimental work is being done by both educators and manufacturers, in some cases with coöperation between the two, and the further fact that great improvement has been made of late, renders the outlook very encouraging.

Perhaps the most important problem just now to both administrators and teachers is the question of movable or fixed seating arrangements. A close second in importance is that of the choice between the separate table and chairs and the seat units. Other problems have to do with sizes, adjustment, and arrangement of seating furniture.

[1] Mr. Ritchie's study was made at Teachers College, Columbia University, and at the present date has not been published.

MOVABLE *vs.* FIXED SEATS

Here the field seems about evenly divided, with perhaps a small but growing majority in favor of the movable type as being more practical and better suited to the needs of modern elementary school work.

Practically all the progressive school people are on this side and arguments for the movable seating arrangements are many.

There is great economy in having free floor space; and the more limited the space in a given room, the greater the need for having movable seats and desks. For example, thus equipped an assembly hall can be used for its own purpose and also as a study room, a playroom, a gymnasium, for exhibits, for community dances, and in many other ways. Or where there is no assembly room, a large classroom, if equipped with movable furniture, can be quickly cleared and used in any of the above ways or as a substitute for an assembly room.

On the teaching side, a room filled with bulky, immovable desks and seats will make things difficult, if not impossible, for the flexible program; for active work and play alternating with study periods and formal work, and for the activities of the small free group or the individual worker.

With movable seating arrangements any classroom can be used for group work, in large or small groups which may be changed or combined as necessary: for dramatizing a story, playing games, serving a lunch, accommodating guests from other rooms; and it will allow individual freedom in many ways.

On the side of sanitation and health, also, there is something to be said for the movable arrangement. The position of such seats can be adjusted to meet constantly shifting lights, when the use of shades would cut off needed light.

Still another point to be considered is that where the seats

need not be screwed down, floors of more sanitary type, such as linoleum, cork, composition, or cement, can be used. Cleaning, too, is made much easier. Also, the children have a great deal more freedom of movement.

Most of the objections to movable furniture — which need not be recounted here — usually disappear after the plan has been tried out intelligently.

CHAIRS AND TABLES OR SEAT-UNITS

There seems no doubt that the separate table and chair plan is best for the young children, preferably through the third grade, certainly through the second, and absolutely for the kindergarten and the first grade. Many of the progressive schools use them throughout the entire elementary school. It is also a less expensive plan, since one set of chairs may be used for a variety of purposes, and duplicates avoided. After the second grade, however, many teachers prefer the chair unit (a chair with an arm and a drawer). Others find the movable desk unit more satisfactory. This seems at present a matter of individual taste.

CONSTRUCTION OF SEATS AND DESKS

Much is now being said about the structure of the seat, the relation of the seat to the desk or table, and other factors. Here again experts differ so widely that the layman can only wait for future conclusions.

In general it seems common sense to conclude that comfort, steadiness, adjustability, and good looks should characterize the seating equipment. Many firms that make such equipment are conforming to these requirements.

There is no perfect seat. Neither is there any seat which will produce correct posture, though of course certain makes are conducive to it. All extravagant claims of dealers should be discounted by the school purchasers and the teachers.

ADJUSTABLE SEATING

There are many angles of discussion with regard to adjustable furniture, also, for here the question of measurements and standards comes in. However some method must be employed for meeting the needs of the different sizes of children in the same room. Use either an adjustable seat unit or several sizes of unadjustable seats, regardless of whether they are fixed or movable. The children should be reseated at least twice a year — a task that requires care. Each firm will give suggestions as to the size of its particular seats in connection with a given grade.

ARRANGEMENT PROBLEMS

With all seating arrangements the question of lighting should be kept well in mind. There should be no glare, no facing the light, no shadows on work; and other points in correct lighting must be seen to.

The teacher should form the habit of glancing often around the room, changing the position of any groups which are in a bad light, and adjusting shades properly. The children, also, should be trained to pay attention to these things.

The arrangement of the movable furniture varies from time to time. Sometimes all the children are in a large informal group facing the teacher; then in a small circle, or a large one; sometimes they sit in straight rows around the wall, for the sake of having open floor space; still again they break up into groups of from two to ten, scattered throughout the room, so that handwork, stories, reading, studying, discussing a group project, having a "lesson," may all go on at once.

The straight rows of the old fixed desks should never be attempted, for with movable furniture the rows will not stay straight nor the spaces even; in fact, such a plan is op-

posed to the very ends for which it is designed — freedom, informality, individual effort, social activity, group activity.

Screens are set up, moved, and folded again; and movable cases are pushed to and fro, separating groups or uniting them again as may be required.

This moving need not cause undue confusion. The children can work out their own rules for handling the chairs, and after a little practice the rearranging will be brief and not disturbing. "Domes of silence" (from any furniture store) should be placed on all movable pieces. For the arrangement of fixed seats, even greater care in regard to lighting conditions is necessary. A few seats should be planned for left-handed children. A space in the front or at the back should be left free for work or play activities. In some schools this free space is in the center, the seats forming a U-shaped group. If free space is not available, a few desks may be put on skids for moving — even though the larger number must remain stationary.

MOVABLE CHILDREN

Whatever the plan used, however, every teacher should remember that there is no magic nor infallibility in any one type of seat nor plan of arrangement, and that the all-important thing is to keep the children moving. Sitting too long in any seat is bad, however excellent the seat. By allowing free movement and frequent change, many of the bad effects of poor seating can be prevented. As one educator puts it, the screwed-down child is a far greater menace than the screwed-down desk.

RECOMMENDATIONS

All furniture and equipment should be suitable in size and height for the children who are to use it, and accessible in arrangement and placing. All seats should be movable if possible; if not, at least half of them.

Separate tables and chairs should be used in the lower grades, and any desirable type of desk or seat unit in the upper grades. Provision for children of different sizes must be made through adjustable seating equipment or through three sizes of seats. The children must be allowed to move freely and must not be kept long in any one seat or position.

HELPFUL REFERENCES The definite help needed in this connection is still lacking. A few books or studies are listed in the Appendix.

EQUIPMENT The following plans and equipment are offered under these heads: I. SEATING EQUIPMENT. II. OTHER FURNITURE AND FIXTURES. III. BLACKBOARD EQUIPMENT. IV. SPECIAL FEATURES.

I. SEATING EQUIPMENT

Seating plans for classroom and general school needs, and details in connection with chairs, tables, desks, and combinations of any of these are included in the discussion which follows. Needs differ greatly in different types of schools. No one type of construction can at present be recommended, because, as has been already said, the various school authorities at work on these problems have different standards.

The following firms are doing experimental work, and are building school furniture along improved lines: the Barnet Phillips Company, the American Seating Company, the Delaware Chair Company, the Plimpton Scofield Company, the Scientific Seating Company.

a. FOR CLASSROOM USE

There should be seating equipment for each child, with a few extra places provided for special needs. If desks of the regulation type are used, there should be enough extra chairs to seat a full section, if possible — or at least 12 chairs for use at work tables,

reading tables or by special groups — and two or three extra tables.

The matter of finish is important. A glossy surface is bad for eyes. The color should harmonize with the other fittings of the room and with the walls. It should be durable and easy to clean. Light oak seems the most serviceable. Darker oak is sometimes used, and gray or green stain, especially in the kindergarten and the lower grades. Ritchie, in his study of school furniture already mentioned, suggests as a practical finish for new and old furniture a light golden oil stain, covered with a coat of shellac. When this finish is dry, rub it down with sandpaper to remove the gloss and give it two coats of floor wax. Other colors of stain could be used.

1. *Separate Chairs*

Separate chairs, to be used for group work, with tables instead of desks or as extra chairs when there are regular desks, can be had from dealers in different types and in all sizes from kindergarten to adult, in any finish desired. Old chairs may sometimes be adapted.

(*a*) A strong oak chair, with a saddle seat and a curved back that gives good support is best for hard usage. No special make is recommended, but the firms listed will advise as to suitable sizes and proportions for each grade. Prices $4.50 each, and up, with a good discount.

(*b*) Light-weight chairs are less durable but also less expensive. These may be used for regular service in kindergartens, and in other grades as extra chairs.

(1) The Mosher chair from the Milton Bradley Company is a well-built, light-weight chair for kindergarten and first grade only, finished in green or brown, or left unfinished.

(2) A sturdy, light-weight, straw-bottom chair, very comfortable, in 13- and 15-inch size, is made by the Delaware Chair Company. It costs from $2.75 to $3.75, varnished or unfinished.

(*c*) Special chairs, low, comfortable, and attractive, for use at reading tables, in play corners, or for other purposes are desirable in every room.

(1) Children's willow, wicker, and reed chairs are attractive and are substantial enough for this use. They come from any furniture, or mail-order firm, also from Minnett, and Grand Central Wicker Shop, J. Bittel, J. Seidel, Syracuse Basket Company.

(2) Children's chairs from home — straight chairs or

rockers — are always acceptable in the lower grades. Mending and painting are done when necessary.

(*d*) The sawed-off chair for adults is not a proper type of seat for children but may be used where no other can be had, or for a transition period, to supplement desks and make group work possible. Suitable chairs, however, should be purchased as soon as possible.

Old straight chairs can be collected; any size, condition, and color will do. It is easy, by sawing off the legs, to lower the chair to the desired height. If the back is very straight, make the back legs about an inch or an inch and a half shorter than the front ones. If the chairs are top-heavy, saw the backs off part way, and sandpaper the edges smooth. Glue spokes and rounds in; replace the seats, if necessary, and then paint the chairs (p. 90) to match the woodwork or the other furniture. It is remarkable how a coat of paint will pull together the different shapes and sizes.

2. *Separate Tables*

Tables are needed in every room for many purposes; the type of table depends upon the use. All school tables should be strong and sturdy.

(*a*) *Tables for regular work* (desk substitutes) are for one child or for two, four, or six children, never for more. The smaller tables, for two children, are preferred. These tables may be purchased or made locally. The tops must be smooth and even, and the whole article sturdy.

(1) All measurements should be carefully made. The height of the table should be approximately as follows: For use with 12- to 14-inch size chairs, 10 inches higher than seat. For use with 14- to 17-inch size chairs, 11 inches higher than seat. This would average 22 inches for the first grade and 24 inches for the second with a few tables higher or lower or both. (See chair proportions.) Measurements for other grades are determined in the same way.

The size of the top should give 500 or more square inches to each child, but this is seldom possible. The following sizes have been used in progressive schools.

For primary grades: one child — top 21 × 18 inches; two children — top 42 × 18; four children — top 64 × 18 inches;

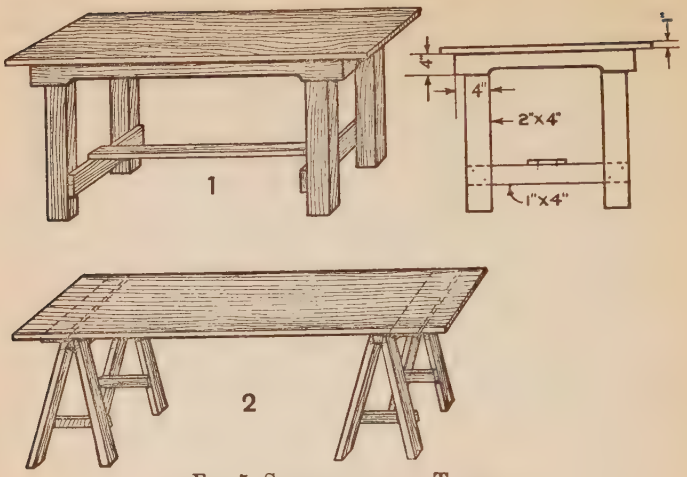


FIG. 5. SUGGESTIONS FOR TABLES

1. A sturdy table for any kind of work. 2. Trestle table.
These may be made successfully in most schools in any desired size and height.

six children — top 72 × 36 inches. For all grades: top 20 × 45 inches; larger tables made by combining these.

(2) Tables may be purchased. All school-furniture houses now carry separate tables of oak in all sizes and heights. These are expensive and heavy for shipping. Pendleton and Townsend and Milton Bradley have good folding tables which are rigid and sturdy when set up. Ordinary kitchen tables lowered and properly finished are very satisfactory.

(3) Tables made to desired measurements by a carpenter through the manual training department are probably the best and most economical.

(*b*) *Extra tables for other purposes* (reading, construction carpentry, illustration set-ups, lunches, exhibits of nature material) are always needed, especially if desks or chair units are used. Any size or style will serve which suits the space to be occupied. In addition to the above types of tables the following may be used.

(1) Trestle tables of any length and height (long, smooth, well-cured planks of white pine, poplar or other light weight wood, supported by "sawhorses" or small trestles) are often used for

exhibits, picnics, parents' entertainments, and special handwork, and are easily stored when not in use, since the planks are not nailed on. A practical unit required 2 planks, each $\frac{3}{4}$ to 1 inch thick, 5 or 6 feet long, 10 to 12 inches wide, and two strong "horses" (2 × 4 stock), each 20 inches high and 10 to 20 inches wide. For longer planks a support about every $4\frac{1}{2}$ feet is needed.

(2) Old tables and stands are often as satisfactory as those made or purchased. The legs can be sawed off to the desired height. If the frame presses on the children's knees, cut it out in a curve in order to give the needed space. If the top is warped or split, put on a new one.

(*c*) *Movable individual desk tables*, with space for books and flat or slant tops, are made by school-furniture firms. These are used with separate chairs and finished to match them. They are preferred by some schools to regular tables.

3. *Other Seat Units and Plans*

There are many combination plans which make the seating equipment movable and adjustable. These plans should be helped out by having several tables and additional chairs.

(*a*) *Chair units:* Chairs with tablet arm and drawer are widely used and offer many advantages for older children, though they are not so desirable for the primary grades. Care must be taken that the model selected does not tip easily. These chairs are obtained from the firms listed.

(*b*) *Desk units:* That is, desk and seat welded together and the whole unit movable. These take up more room and are not so flexible for use, but are preferred by many authorities because they keep the seat and the work surface in proper relation to each other. The American Seating Company has a good model, mounted on an iron frame.

(*c*) *Desks already on hand* can sometimes be adapted for use.

The fixed desks, single or double, can be made movable by screwing them to strips of hard wood (1 × 4) instead of to the floor. The strips may be cut in pieces short enough for a single desk and seat or long enough for several. The former plan is best. Measuring and screwing on must be carefully done so that the proper distance between seat and desk will be kept.

These desks on runners or skids may be quickly pushed to the side of the room and as quickly replaced, which makes it pos-

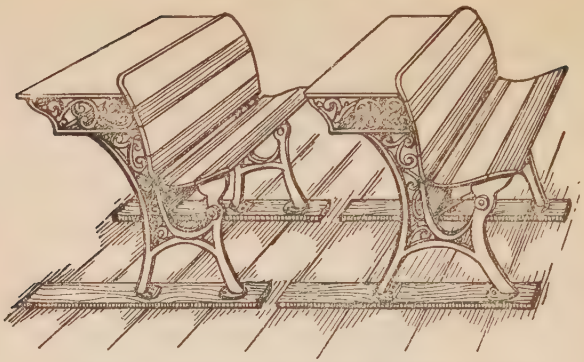


Fig. 6. Old Fixed Desks on Runners or Skids

sible to have free floor space as it is needed for games and for other purposes. Every school which cannot have approved movable furniture should try this plan. A few of the front or back desks might be tried out first; if the room is large, that may give all the extra space needed.

(*d*) A combination table-settle (a seat with a box underneath and a back which folds over into table form) is often a help. These table-settles may be made, or they may be purchased from mail-order or regular furniture firms.

(*e*) A floor bench is used for extra seats and also for children to stand upon if the blackboards are too high. It is made of a single plank, 1 inch thick and 12 inches wide, with supports 2 inches thick and 9 inches wide. The height depends upon need. The length is from 4 to 6 feet.

b. For General School Use

1. *Auditorium or Assembly Seats*

(*a*) *Fixed opera* seats are best for a large auditorium with an inclined floor, if the room is used for no other purpose. Architects or contractors supply plans for them.

(*b*) *Movable auditorium chairs* in small sections (3 to 5 chairs each) are best for the average assembly room which must be used for other purposes. They cost more than the single straight chairs.

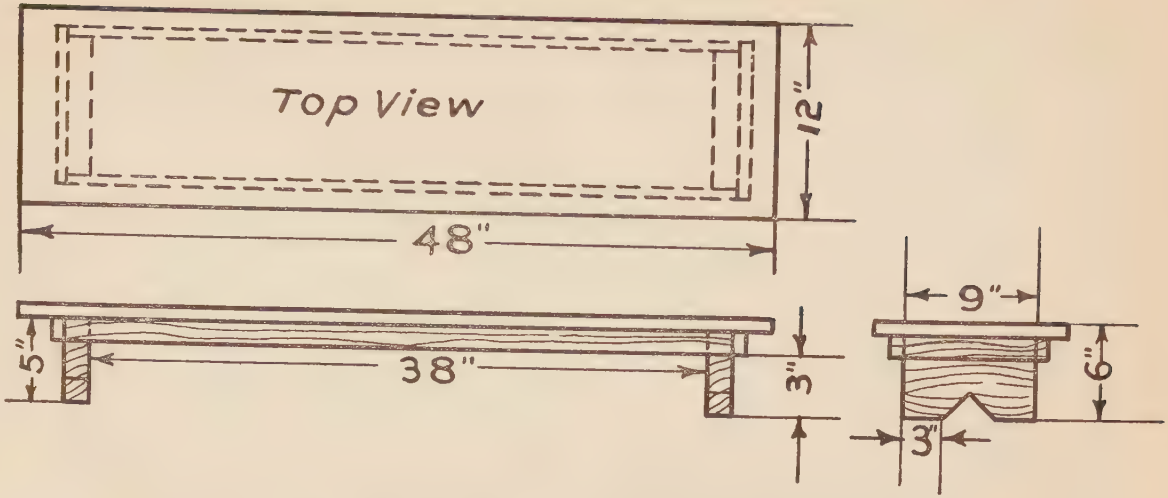


FIG. 7. WORKING DRAWING FOR FLOOR BENCH
(Courtesy of the Manual Training Department, Oswego, New York, Normal School)

but are better. Obtain from any of the school furniture firms listed. A comfortable folding chair in sections can also be obtained, and will serve very well.

(*c*) *Chairs of a more formal* and substantial type are desirable for platform use. These come from any furniture store or supply house.

2. Miscellaneous Seats

(*a*) Chairs which can be used for many purposes and moved easily are needed in a small school, especially where there is no regular assembly room or where the assembly room is used for other purposes.

(1) *Folding chairs* are especially desirable where space is very limited and one room must serve all or many needs — must be, for example, classroom, assembly room, gymnasium, and the place for parent-teachers', teachers', and community meetings. These chairs, however, should never be used for study nor for young children. Purchase them from the mail-order, school-supply and furniture houses. The cost is from $1.25 apiece, up. Fife has a large selection.

(2) *Regular straight chairs* are best for general use and are much better economy; the lighter weight the better. A straw bottom is comfortable and can be replaced easily though it is not so durable. Especially recommended are those that come from the Delaware Chair Company, made in three sizes.

(*b*) *Low comfortable chairs* in the office and one or two in the classroom for teacher or visitor are attractive and restful. A willow or wicker chair is good for this purpose, since it does not have hard service and is not very expensive. This kind of chair comes from Minnett's, the Grand Central Wicker Shop; the Syracuse Basket Company; Jacob Bittel; Seidel; and mail-order houses. A porch chair (not a rocker) will also serve.

(*c*) *Folding canvas lawn chairs* (p. 267), with foot rest, are often used for rest periods. They cost about $2 each at furniture or mail-order houses.

(*d*) Other seats are described in the following section under Boxes.

II. OTHER FURNITURE AND FIXTURES

a. Screens

Screens are indispensable in the modern school. They are used to separate groups of children; to close off a corner of the room for special work or unfinished work; as temporary display or bulletin boards; as a playhouse or for use in classroom dramatics (p. 191); as background, entrances, dividing walls, or substitutes for front curtains in connection with chapel exercises, plays, and entertainments (p. 191); and for movable blackboards. Each classroom should have one or more screens. If they are uniform in color and height, they may be quickly assembled for any required use. Different types are shown in the accompanying sketches.

1. *Folding Screens*

A folding screen is most practical for general use, for it may be easily stored when not in use.

(*a*) A school-made screen with three or four panels, each about 65 inches tall and 25 inches wide (72 × 30, or other desired dimensions), fastened together with double-action screen hinges (mail-order, hardware firm) or with leather strips, is advised.

(1) The frame is of 2 × 1 or 3 × 1 inch stock fastened together with corrugated fasteners or No. 8 ($2\frac{1}{2}$ inch) flat head screws with No. 2 brads at each point.

(2) The covering may be of burlap, flat-tone oilcloth, leatherette, canvas, or some other heavy fabric tacked on smoothly and finished with dark tape binding or narrow wood strips, as shown in the drawing, or of composition wall board grooved in, and braced on both sides with a one-inch strip.

(*b*) Old screens with good strong frames can be re-covered and painted or stained.

2. *Stationary Screens*

(*a*) A one-panel screen with a steady standard is also used. It may be of any desired dimensions.

(1) The frame is of 3 × 1-inch stock or if very large of 3 × $1\frac{1}{2}$-inch stock.

(2) The larger supports are of 2-inch stock or must have sufficient spread (12 to 24) inches at the bottom to hold the screen steady when it is standing alone.

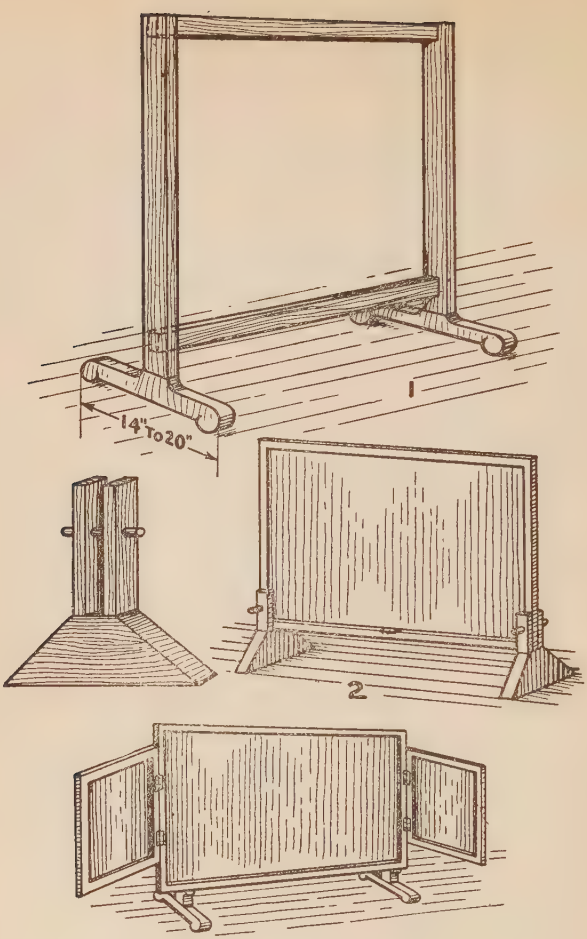


FIG. 8. SUGGESTIONS FOR OTHER SCREENS

1. Frame for Stationary Screen.
2. Collapsible Screen.
3. Screen with wings.

These may be made of any desired dimensions and material

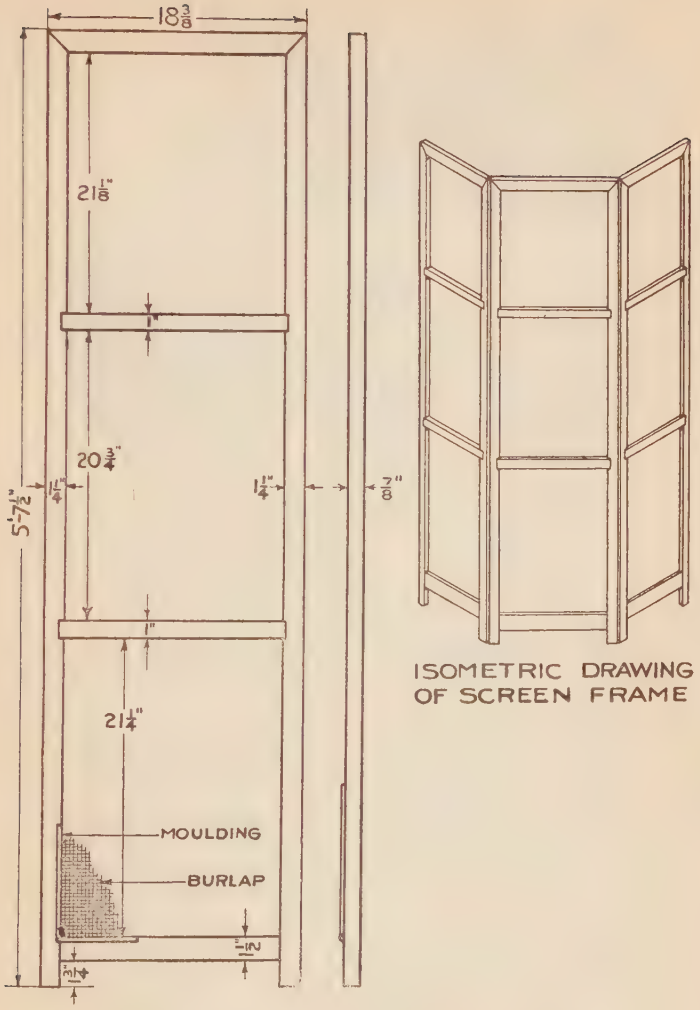


FIG. 9. WORKING DRAWING OF FOLDING SCREEN

Designed and used in Passaic, New Jersey, Public Schools
(Courtesy of Vocational School, Passaic, New Jersey)

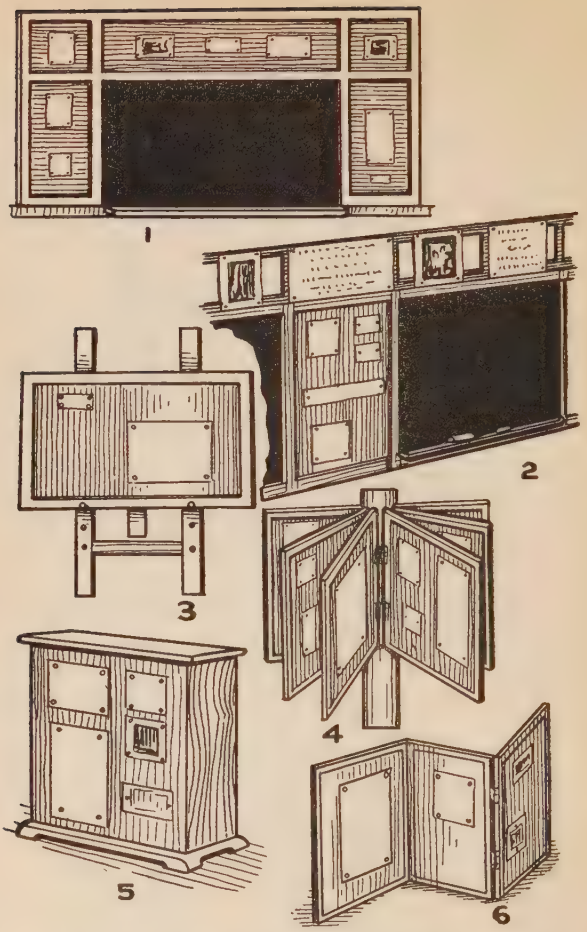


FIG. 10. SUGGESTED PLANS FOR BULLETIN OR DISPLAY SPACE

1. Around blackboard.
2. Adjoining and above blackboard.
3. Movable board on easel.
4. Folding or wing boards or displayer.
5. Back of movable case.
6. Screen.

(3) The covering may be of composition wall board or blackboard, for classroom use, or of wire fencing, lattice strips, or cloth for plays (p. 191). A curtain also makes an attractive covering for certain purposes.

(*b*) Short swinging wings may be hinged on to these screens. When not needed, the wings fold flat against the large panel.

3. *Collapsible Screens*

A screen which comes apart may be of any desired size.

(*a*) The two supports are made of 2 × 2 stock, preferably oak or some other heavy wood, each with an opening in the upper part into which the screen may fit. Bolts or pegs will hold the screen steady while it is in use. The proportions depend upon the height and weight of the screen sections. Ask a carpenter's advice.

(*b*) The screen is made of wall board, framed in narrow molding, or of lattice strip.

4. *Other Screens*

For other screens used for plays and dramatics see p. 195.

b. Bulletin or Display Boards

These boards are indispensable in modern school work for practically every type of school activity. Definite suggestions for their use have already been given in other chapters (pp. 42, 157, 214). Such boards may be fixed, movable, or folding in type. Each type fills a special need; usually all three are required.

1. *The Wall Board*

The wall board is placed flat against the wall. Where wall space is very limited, this board may be omitted.

(*a*) The surface may be burlap (35 cents a yard), board (5 cents a square foot), linoleum (35 to 85 cents a square yard), cork board (50 cents a square foot — Hammett). The material should be plain and soft in color — tan, brown, gray, or green to match the room. Tack it on the wall. Paste burlap.

(*b*) The frame is a flat strip or molding — 2 to $2\frac{1}{2}$ inches wide — of any soft wood, painted or stained to match the woodwork, and nailed in place.

(*c*) The size depends upon the wall space. Sometimes two sections are necessary, but at least 6 × 4 feet of space is needed for the average room.

(*d*) The placing of the board is important, since it cannot be moved. From 24 to 26 inches from floor to lower edge for primary grades, 30 to 34 inches for older children, will be about the right heights. A good light on the board and free space in front are necessary for effective service.

2. *The Movable Board.*

This type of board is especially good for crowded rooms, and for use at chapel exercises and entertainments; also for outdoor primary reading lessons. It is made of composition wall board with a 2- or $2\frac{1}{2}$-inch frame of flat molding of thin white pine or poplar; $3\frac{1}{2} \times 3$ feet is a convenient size for moving easily. Two or three boards will be needed if there are no others in use. Two screw eyes placed in the top of the frame a few inches from each end will fit over nails and hang the board flat against the wall. It may rest on an easel if that is preferred.

3. *The Wing or Folding Board.*

This type of board which looks like a large book is especially advised for museum and library use and where space is limited. It consists of a series of small boards on hinges, secured to an upright strip or support which is either attached to the wall or the floor, or left movable. These boards swing together and close flat like the leaves of a book. Both sides of each board may be used. Glass may be added. The size varies. 30×44 inches is a fair-sized wing with from 5 to 10 wings; others may be added as desired. The board may be made by a carpenter or purchased ready-made.

(*a*) School-made boards have wings made of composition board with narrow wood frames; the support is a strong piece of wood, wide enough to accommodate all the wings. A carpenter will give advice about making them and about the proper size of hinges to be used. That depends upon the weight of the wings. A post or some other frame work should be used to support the boards.

(*b*) The ready-made "displayer" is of composition board with metal frame and supports. It is very expensive ($50 to $150), and not artistic in appearance, but is sometimes used. Obtain from The Universal Fixture Corporation or from library firms.

4. *Miscellaneous Display Space*

(*a*) Besides these regular boards, screens, and panels, the back of a movable bookcase or shelf is good for temporary use.

(*b*) Strips of soft wood about one inch wide are sometimes placed about 16 inches above the blackboard and flat work or pictures attached to them with thumbtacks for a short time.

c. Window Shades

Window shades are a most important consideration. The purchase of the right kind should be the first step in school improvement.

For regular use the shades should be adjustable (and kept adjusted to the changing light), translucent (allow the light to come through fully), light in color (buff or tan preferred), and wide enough to overlap the glass area so that no streak of light can be seen between the frame and the shade (careful measurement is needed here). Draper and Forse shades, and other makes from furniture and supply houses, are satisfactory. New improvements are being made constantly, and so it is wise to investigate before buying. State Departments of Education will advise as to makes and devices. The *American School Board Journal* also gives suggestions in its advertising columns. Prices vary from $2.35 to $5 per window, according to the length and width of the shades.

Extra shades of dark green opaque cloth, for darkening a room at times may be fastened at the top of the window and kept tightly rolled when not in use. In many cases these shades are already at the windows and may be left in place when new adjustable shades of light color are added.

III. BLACKBOARD EQUIPMENT

This is fully covered in government and state bulletins and in books on educational topics listed in the Appendix.

IV. SPECIAL FEATURES

While the problem of the school building itself falls outside the scope of this book, an examination of the plans of expensive new buildings now going up all over the country reveals certain very definite lacks which surely require the attention of architects and others who are concerned with schools. There are many seemingly minor details which in reality make a tremendous difference in the everyday work

and which could easily go into the plans at little extra expense. There is often much wasted space which could be used effectively for some of the extra rooms needed in the modern school, such as coat rooms, a library-museum, a kitchen, a rest or sickroom, a teachers' room, an assembly-play-gymnasium room, work or group rooms, and rooms for the outside activities (for example, Red Cross meetings and medical clinics), which in some communities must be accommodated in the school building.

A special plea is made here for the small group or work room opening into the classroom. This is very important in making the free type of work possible, and thus helping to develop the child's initiative and freedom. It is used for work which is done to best advantage away from the class as a whole — carpentry work, concentrated study, group discussions, or rehearsing a play — and also to hold cupboards, shelves, and other storage arrangements. Science materials, unfinished work, and other temporary work may be kept here and the classroom thus relieved of much congestion.

A workroom for each classroom is ideal. Certainly there should be one for each two classrooms, situated between the two and opening into both. Good light is needed; the size of the room is less important. In some instances a good-sized room is needed, in others even so small a space as 10×12 feet is best.

The following suggestions are offered. Some may apply to either new or old buildings, others are only for those which are already in use:

a. Built-in Storage Features (see Where to Keep Material, pp. 326–339)

b. Window Steps

Steps built from a low window on the first floor to the ground are

a great convenience to the younger children in one school as an exit to play in field and garden. This plan saves time, gives the children more freedom, and prevents other groups who are at regular work from being disturbed.

c. Extra Rooms and Work Space

The problem of what to do when arrangements for school activities are not provided, is ever present with the teacher. The following plans may help:

1. *Classroom Balcony*

Where extra floor space is greatly needed in the classroom, a small balcony with a railing, properly placed for light and in the

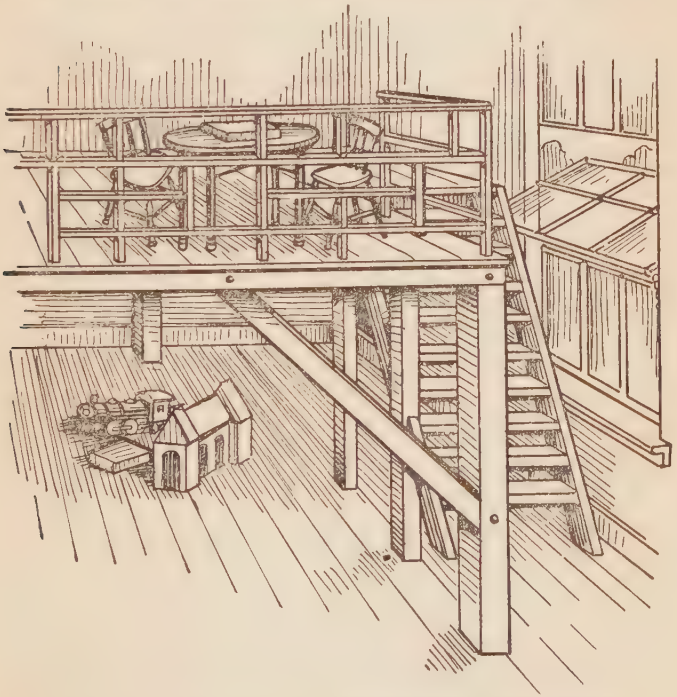


Fig. 11. Small Balcony to Provide Extra Room Space

right proportion to the room, will be attractive and also most helpful. Individual and group activities may go on here — reading, quiet games, handwork, and dramatic play. The balcony should not cut off light from the seats or from other work. The City and Country School of New York City makes use of such balconies.

(*a*) The size depends upon the room and need. 4 ft. to 6 ft. is a usable width, the length to be determined by wall space. The railing should be at least 3 ft. high. The height from floor should be sufficient to allow space below to be freely used ($4\frac{1}{2}$ ft. minimum).

(*b*) The children climb up by a fixed ladder, or steps may be made. For little children, a sliding board may be attached for indoor play.

(*c*) A balcony of this kind should be built by a carpenter; and it should be seen to that the supporting beams and railing are strong and secure.

2. *Partitions*

(*a*) A fixed screen or half partition which serves as a combination screen, bulletin board, blackboard, and general utility arrangement is most successful for the overcrowded, poorly equipped school.

(1) The screen partition should be of lumber or of wall composition board, strongly made, with a steady support, and fastened firmly to the floor.

(2) Sometimes short swinging wings are added. They are hinged on to the screen and are folded forward or back to make a small inclosure.

(3) The outside (which faces the room) is used for a bulletin board or for a place on which to dry the children's paintings, or it may have built-on, narrow shelves for books, or a cupboard.

(4) On the inside there may be hooks for wraps and for unsightly articles such as brooms, mops, and dusters; even garden tools and hose may be kept out of sight here.

(5) The height and length and placing of the screen partition depend upon the use. About 6 feet is the average height; the length varies. The placing should not interfere with the necessary supply of light. Sometimes, on the other hand, the screen may help to cut off objectionable lower light. Set about two feet from wall — or farther, if space permits.

(*b*) Wall partitions (sound-proof if possible) add to the number of separate rooms and are used:

(1) To cut off for use well-lighted, dry, unused space in the basement or halls.

(2) To divide a large room into smaller rooms.

3. *Other House Plans*

(*a*) A wide porch, either enclosed or used as it is, will offer possibilities for a small group room or shop.

(*b*) Occasionally an attic can be done over for a museum or shop for the older children; a ladder is used instead of steps.

4. *Outside Plans*

Many possibilities are found in outside rooms in the form of an annex, new or old temporary buildings, and old outhouses. These outside rooms should be connected with the regular school, if possible, by a covered passage, and some method of heating should be planned. Rooms of almost any size may be used. Lattice frames, vines, and paint will make them attractive.

(*a*) Old outhouses (sheds, wood houses, etc.) can often be fixed up to fill the need. Sometimes rough shelving and whitewash will put them into usable shape. In other cases it will be worth while to add a new floor, side walls, or a roof. A cement floor is the easiest kind to make. In warm climates artificial roofing, which comes in sheets, will serve for sides.

(*b*) A new room or annex so planned that it will harmonize with the main building — if possible, of the same color — may be built from old lumber purchased cheap or donated, or of new lumber.

(*c*) Second-hand, ready-cut garages or temporary houses, no longer needed, may be sometimes purchased at great reduction, or new from Sears-Roebuck & Company or other firms.

d. Equipment for Sanitation and Health

A few suggestions are given in parts of this book (pp. 264–270). Full information will be found in health bulletins issued by the Bureau of Education, the state departments of Education, the National Education Association; also in books listed in the Appendix. New material on the subject is being constantly offered in pamphlet and book form.

CHAPTER NINE

PROBLEMS GROWING OUT OF MATERIALS AND EQUIPMENT

PROBLEMS Out of the need for, and the use of, school materials come a number of practical problems and difficulties. Some of these are of great importance if a liberal curriculum and successful activities for the children are to be achieved.

The expense, with its double action in wasting old things and spending money for new things, is almost sure to be a stumbling block. This matter of expense is likely to be the first objection raised in any discussion of better school equipment and of more material for work, and it is nearly always the explanation of why there is such reluctance in taking a forward step in this matter. Especially is this true with the teacher who must sometimes make over the school or the room from the floor up — often with little interest and no support from any one else. Hence, such matters as how to get the needed money, how to spend it wisely and economically, and how to care for the material purchased, often raise questions that must be answered. The problem of what to do with material is always a live one. It would seem, therefore, that some discussion of ways and means is much needed. It is certainly true that by taking thought and counsel, much time, trouble, effort, money, and space may be saved. Even a big educational principle is sometimes conserved through practical methods.

While many specific suggestions belong with the special materials, there are some plans which have general application. Some of these are outlined: I. Financial and Organization Problems. II. Storage Problems.

I. FINANCIAL AND ORGANIZATION PROBLEMS

a. How to Obtain Money for School Needs

Of course the proper thing is a regular allowance from school funds — a certain sum set aside each year for supplies, new equipment, and repairing of old equipment. The larger school systems have this plan, but the average school must go elsewhere for help at first. However, every one who is interested in obtaining such an allowance should begin at once to work toward that end through a campaign of educating parents, taxpayers, and school authorities. Quiet, persistent work will bring results in the end, for often after long efforts which seem fruitless, suddenly we have our wish. In the meantime a start in raising school funds must be made some other way. The method must be *chosen to fit the community*. Great wisdom is needed here.

1. *Parent-Teachers Association*

As first aid — not only for actual immediate needs but also for bringing pressure and influence to bear on the school authorities — the Parent-Teachers Association is a comfort indeed. To these organizations we may confidently look for help in making the schools places where the children can be safe and happy while they work. Each association has its own methods for getting the needed money and most of the women's magazines conduct departments or provide printed material that will add to their ideas. Leave the ways and means entirely to the parents.

Always the teacher must have a definite request to make of the association, some special need. Asking for one large item is better than for several small ones. This is true of all appeals to all organizations; there is an added interest and pleasure in giving when the result promises to be big enough to make the giving worth while. Requests for movable furniture or chairs for group work, for a small piano, a victrola, scales, a hot lunch outfit, an encyclopedia, and things of that kind are more likely to rouse response than requests for handwork supplies.

A direct appeal to the School Board for a special thing is often more effective if initiated by the Parent-Teachers Association. The argument that other schools have the desired material is likely to reinforce the appeal, but of course the real reason for the need must be clearly stated. To much assertiveness is very bad; tact works wonders in this connection.

2. *Civic Organizations*

In many places the City Clubs, Chambers of Commerce, Rotarians, and other organizations of men are joining forces with the schools. The larger projects appeal to them, and so do the thoroughly practical ones. A baseball field or other playground equipment, a swimming pool, a picture machine, drinking founts, chairs for the auditorium, typewriters, adjustable shades, and money for fixing up the school grounds or painting the building have come from these sources. Once enlisted in the cause, these organizations are staunch friends, and the interest grows with each new gift. Appreciation on the part of the school and expression of that appreciation are very important. Some public school systems, however, for very good reasons do not accept gifts; this possibility must be considered in making plans and requests.

3. *Children*

Then there are the children themselves — a great source of untouched energy and power if wisely handled.

(*a*) Not only will they make things, but in some communities they will also earn money. Nickels and dimes that had been intended for candy, soda water and "movie" pleasure are often contributed to the school bank with enthusiasm. Dishes will be washed, errands run, lawns cut and many other jobs done to earn money for new tools, books, and paper and for crayon or paint for the dingy walls.

(*b*) And how far the youngsters can make the money go! With a little directing the older ones do much practical work. They can calcimine, paint, put desks on a movable base, and do many other things which are truly amazing to the outsider.

(*c*) Sales of children's handwork at school bazaars and candy sales are profitable. Care must be taken that full *value* is given for the *money received.*

(*d*) For the children's entertainment, an old device of making money, not so much can be said. In its familiar form — an intensively trained for and elaborately costumed affair including trashy songs and dances and ending in frazzled nerves, and worn-out, excited teachers and children — it is a truly dreadful thing. A simple play or festival growing out of the regular work in history or literature, or a pageant given by the whole school, has a much stronger case. But the effect on the children is far better if such

entertainments are given for the pleasure of their friends, not for money, and it is urged that this way of earning equipment shall be used only as a last resort.

4. *Outside Help*

Parents or friends who can do helpful things are always to be found, particularly if the idea is general that the school belongs to every one in the community. A friendly carpenter will help build in a cupboard after work hours, a painter will mix calcimine, paint for the walls or furniture. The local stores will sometimes give wholesale prices on supplies, besides saving up for the school boxes, paper, and other treasure. Mothers are invariably willing to give an hour of work now and then if we make it good fun and gain their interest. For the teacher who has never tried this plan wonderful experiences are in store and any feeling of loneliness and lack of appreciation is likely to be superseded by new contentment and warm friendships.

5. *Other Methods*

Other ways and means are possible:

(*a*) In some cases where parents are well-to-do, the smaller work tools and materials such as scissors, paste, crayons, paint, paper, and clay, may be bought by the children just as they buy books, tablets, and pencils. In other cases, parents will pay a small fee; fifty cents a term or one dollar a year will help greatly in buying supplies.

(*b*) Old tools (p. 121) to be mended and sharpened will often be given. Old tables and chairs (p. 295) will come from attics and when painted and lowered prove of great help. Cleaning (p. 264) and other supplies will often be given from the home stock.

(*c*) Sometimes a special friend of children, or an individual parent who is interested, will supply a special need; or a group of friends and parents will club together to help, each buying a single article.

6. *Restatement*

All these aids as suggested, however, are merely makeshifts and temporary measures. Sooner or later the school fund must take care of the legitimate needs of the school as naturally as it provides for buildings, furniture, and teachers. Teachers, children, and parents will unite in conserving and wisely using the material and equipment thus supplied.

b. How to Spend School Money

When money has been obtained, whatever the source, it should be carefully used. There should be no haphazard buying for schools. Many dust catchers and other evidences of wasted money are in our schools, while at the same time work is handicapped because needed things are lacking. Before there is any actual buying done there should be careful thinking, planning, and organizing, with plans for future as well as present needs. Small details as well as larger items should be considered, for small sums soon pile up into large ones which often, in the end, count for nothing. Again, a good investment for one school may be a very poor one for another. For example, a hot lunch outfit, a necessity in a rural school, would be unused in a village school, where all the children live near by and go home to lunch.

The following questions should be asked before a single purchase is made: Is this our greatest need? How much will it be used? Can it be cared for properly? Is it strong and lasting? Will anything else do? Can it be made at home with less expense? Can we share its use, and hence the cost, with others?

Taking counsel with other teachers often saves duplication and needless expense. Letting the children have a share in the planning is worth trying out. Even the smallest ones feel new interest and responsibility if they may come into the council and help choose and later buy and take care of the things they use. The final list of needed things should grow out of many discussions of common and individual needs.

In view of the above, it is easy to see that a budget system is essential to the wise spending of money, regardless of the amount to be spent. Coöperation also, both in the purchasing and the ownership of material and equipment, is a valuable financial aid. Much money is saved by it, and often greatly desired equipment, otherwise impossible, can be had in this way.

1. *Budget System*

The individual teacher, as well as the school as a whole, should have a budget. In general, the best time to make up a budget is about a month or six weeks before the close of the school year, when needs are fresh in the mind and the closing rush has not yet begun. Making notes on these needs from time to time during the year is helpful.

(*a*) The teacher goes about making a budget in the following way:

(1) By taking stock of materials on hand and noting the amount used during the year and the tools that must be replaced.

(2) By thinking over new aims and plans for the coming year, and listing equipment and materials that will be needed to carry out these plans.

(3) By working out the cost of the requirements, including carriage, and calculating the amount available for their purchase.

(4) By cutting out all doubtful items, leaving only those which are most important and substituting, where possible, free or less expensive material.

(5) By estimating the exact amount of money available and apportioning it so that the greatest needs are cared for first.

(*b*) The school budget combines the individual budgets of the teachers with additional items which belong to the administrative side, such as fuel, light, salaries, repairs, and furniture. These latter details are worked out in much the same way as that suggested above.

(*c*) The County or City budget follows the same plan.

2. *Coöperative Ownership*

Certain equipment may often be shared by a community, by a group of schools, by all the children in a single school, or by the special grade or group as a whole, and in that way much needless expense, duplication, and need for extra storage space is done away with. Common sense and local conditions, of course, must control such a plan.

Much depends upon such factors as the roads, transportation facilities, the supervisors, clerical help, the amount of storage space, and the number and size of the schools to be served. A single school may need all the material suggested for the group of schools. A room where much handwork is done may find coöperative school ownership of the paper cutter or the printing outfit most inconvenient. Where it means wasting valuable time, there is no economy in such a method. In many cases, however, excellent results are obtained.

(*a*) Granting average conditions (all large city systems

omitted) the county or city *headquarters* of the Board of Education is often the proper place to keep such things as the moving picture machine or the stereopticon, the large (primer type) typewriter, the mimeograph, and perhaps the victrola. There, also, may be kept the museum collections; industrial materials such as specimens of cotton, wool, wood, steel; models or charts which illustrate history, geography, and other topics; a central library with books and mimeographed material for supplementary reading — anything, in fact, which is needed by the schools occasionally or only for a short period. Needless to say, a teachers' library with new professional books, magazines, and pamphlets put out as they appear, should always be located at headquarters.

(*b*) Next comes the question of what may be coöperatively used in *individual schools*, and with this, too, there are many "ifs" in the answer. It would seem, however, that the whole school might use the same scales, piano or victrola (or both, if possible), and sewing machine. A school typewriter and a small picture machine are most desirable. A large central bulletin board is essential. A rubber-stamp printing outfit for charts and signs, in two sizes, a duplicator, a paper cutter, and a strong punch can easily be shared by the entire school. If the school is large and space and means are available, most of the things mentioned for the group of schools are also desirable.

(*c*) The *classroom*, in turn, may have certain things which are used by all the children in the group — not only permanent articles but also equipment for handwork.

This room material is also determined by the space, the money, and the number of children. Certain articles, a paper cutter, for example, would be most welcome in any room. The clock, thermometer, bulletin board, and cleaning materials cannot be passed around, nor can the small punch, the carpenter tools, and other easily misplaced things which the children of one group may properly share. Small sets of certain articles — brushes, tools, games — may be shared by children in the same room if they work in alternating groups.

3. *Coöperative Buying*

Coöperative buying by schools and teachers is most helpful, especially where there is no central purchasing bureau and each teacher or school "goes it alone." The larger the order, the lower

the price and the lower the proportionate cost of shipping. Nearly all staples, such as paper, ink, paste, crayons, and other stock supplies, books, and large equipment are best ordered in this way. Even county systems can often combine to great advantage orders for furniture and stock equipment. Individual teachers who need small amounts of special material, such as cloth, calcimine, and paint, can often buy together and save money on the bill.

4. *General Rules for Buying*

(*a*) Never buy material from unknown firms or agents. This includes books, magazines, picture machines, furniture — everything — especially when agents undersell or offer large guarantees. It is better to pay higher prices from a well-known firm whose name is a guarantee.

(*b*) Always investigate the latest prices before ordering; prices vary greatly, and models change. The prices in this book are always approximate, and when quoted exactly are for 1926.

(*c*) Plans and suggestions and quantities mentioned in this book must all be checked up in terms of each school. All quantities named are merely suggestive and must not be accepted literally, since so much depends upon the questions of use and work conditions.

(*d*) In purchasing for schools, always consider these items in addition to the cost: the distance from the dealer; the weight; the freight, express, and parcel post rates (carriage prepaid or extra); guarantee; reduction for quantity order; discount for cash; terms.

(*e*) Purchase the material at or near home when possible. This will stimulate local interest in school needs, aid in obtaining free materials and other help, and insure material being what is wanted. It will also save shipping cost, or, if higher prices are asked for the local product, at least cancel it. This is especially true of heavy materials such as clay, paper, wood, paste; with them the shipping charges often amount to much more than the cost of the material.

(*f*) Order the material, as far as possible, from the same firm. In that way your orders will receive better attention. Also, freight or carriage expense will be reduced — often the total cost, which makes the plan advantageous, even though some of the items are slightly higher than with other firms.

(*g*) Never order unfamiliar material from the description

alone; samples, illustrations, or both should supplement the description.

(*h*) Keep on hand up-to-date catalogues of the firms that you most often deal with, and ask to be on their regular mailing list. Keep the catalogues in alphabetical order in a special file for quick reference.

(*i*) Be careful about letters; this is important.

(1) All letters about material, free or purchased, and requests for catalogues will receive quicker attention if written on school stationery (p. 282). Write clearly with ink on one side of paper. Be sure to give school address.

(2) Always send money order or check, never stamps or loose money.

(3) Where free material, or addresses, or other courtesies are requested, send a stamped addressed envelope for reply.

(4) Requests for catalogues can be sent on penny postals.

(5) Letters written by the children should be carefully supervised and those sent O.K.'d by the teacher. Some firms will not respond to any letters from children, so care is needed in this regard.

(6) Great care should be taken that only *one* letter of request from the school goes out for free material; an abuse of the courtesy of the donors quickly stops all response to all schools. The travel agencies especially suffer from too many requests by children.

(7) Keep copies of all letters containing orders and of all contracts, quotations of prices, and terms from business firms.

(*j*) When coöperative buying is to be done, select a committee of careful, responsible people to order and distribute the material. All lists and money from individuals and schools are turned over to this committee.

5. *Where to Obtain Addresses* (see Appendix for lists, addresses)

Often the school buyer finds trade names, or firm names, without any address given, or else addresses are incomplete, unfamiliar, incorrect, or doubtful. The following methods are helpful in obtaining a correct address:

(*a*) For such equipment as paper cutter, printing press, scales and other machines, try the *American Digest of Business Machines*.

(*b*) For regulation school goods, consult a School Buyers' Guide (Williams' *Red Book*) and the advertising columns of the school magazines, or write to the State Department of Education for this information.

(*c*) For such commercial material as wrapping paper, plaster of paris, and tools, go to a local merchant, who will locate addresses of firms from his Buyers' Guide.

(*d*) For the address of a near by dealer or distributor in a desired line — for example, a first aid kit of special make — write to the manufacturer (see current advertisements) for information.

(*e*) For addresses of book publishers, write to children's librarians in the public libraries and progressive schools listed.

(*f*) For miscellaneous material, watch the advertising columns of the current magazines.

(*g*) When a *firm* or *trade* or *organization* name is given with no address, try New York or Chicago. Nearly every well-known concern has offices in one or the other of those two cities, and usually some information will be forthcoming.

c. How to Care for and Use Material and Equipment

1. *Care and Conservation*

On either point it is impossible to be too emphatic. It is useless or worse to buy things if they are not to be taken care of. Not only is it a waste of money and effort, but it also helps to develop habits of waste, carelessness, and lack of responsibility. Rusty tools, broken handles, dog-eared or torn paper, stiffened paint brushes, dried-up paint, scarred walls and furniture, lost or misplaced articles, signify — and also cultivate — a poor morale in both teacher and children. In view of this the following points are cited:

(*a*) All material should be *handled carefully* and *used economically* by teachers and children. This covers such matters as getting out paper, using books, moving a phonograph or piano, avoiding waste when using paste, paint, or other material.

(*b*) *Keep* all material and equipment in *good condition* and *in order.*

(1) Suitable containers with close-fitting covers, clearly labeled and properly arranged are of great help. Boxes are best

for heavy things. Tins are best where mice or insects give trouble. Cans that have held coffee, crackers, shortening and other products, well cleaned and painted to prevent rust, are very good. Glass jars are best for calcimine, paint, and paste. Cardboard boxes hold paper, cloth, and light-weight material.

(2) Frequent dusting and periodical straightening are needed.

(3) The occasional sorting and discarding of things badly torn, soiled, or worn is necessary, especially in handwork materials.

(4) Regular periods for mending, cleaning up, and overhauling materials are important. This work includes repairing books and pictures, oiling and sharpening tools and mechanical devices, thoroughly washing brushes, scissors, shelves — and so forth.

(5) There must be protection against destruction or vandalism — good locks, rat-proof cupboards, and other precautions of the kind.

(*c*) Keep all materials and equipment in its *proper place* — cupboard, box, closet, room, as the case may be. Things out of place cause endless trouble, especially where there is common ownership. There is no better way to start a disagreement or break up a happy relationship than for Grade VI, ready for a music lesson, to find the victrola missing and Grade V to blame.

(*d*) Keep *full lists* of all material and equipment for reference, and check up at intervals to prevent loss or duplication.

(1) For the teachers' use a list should be kept on a card in the file (pp. 279, 333).

(2) For general use it is necessary to post on the bulletin board or in some other easily seen, convenient place, a clearly printed chart, showing where all supplies may be found; for example, "Paper supply; 2d shelf, right side, cupboard A"; "Garden tools; in long window seat, north window," etc.

2. *Use and Distribution*

Conditions vary, and the method and type of organization in a given case will depend upon the conditions.

(*a*) The equipment and material kept in the central office and used for a *number of schools* must, of course, be carefully dis-

tributed according to certain well worked out rules. A few suggestions follow, though it must be borne in mind that each system will have to meet its own special problems:

(1) The teachers are notified as to what is available, and the uses and purposes of everything carefully explained. They need help and encouragement in making plans to use this equipment, especially at first, for so often it seems easier to go on in the old way. This is the task of the principal or supervisors.

(2) Application for desired material is made in advance by teachers so that a schedule can be arranged and no school disappointed.

(3) Everything is to be handled carefully, used on schedule time, and returned promptly.

(4) The office keeps careful records of all borrowers, and if possible should assume responsibility for sending out and collecting material.

(5) It is best to have all equipment in charge of one person, preferably the office secretary, clerk, or stenographer, who is always on hand.

(6) Though organization is necessary, there should be as little red tape as possible, with no cut-and-dried keeping of rules *as rules*. It is easily possible to have so much efficiency that the interest will be lost. If using the material becomes difficult or unpleasant, its whole purpose and value will be lost. This is a tremendously important point.

(*b*) Equipment and material to be used by *one school* is more easily managed. Under this plan much freer and more spontaneous use of materials is possible and distribution requires less effort and planning. Organization is needed, however, to avoid friction and overlapping demands, especially with victrola, piano, sewing machine, picture machine and other frequently used articles. Anything kept in a classroom and used by other groups should be moved before or after school or at recess. The following rules worked out by children, help:

(1) A regular schedule for certain regularly used things, such as the victrola or the scales, posted in assigned bulletin board space.

(2) A special notice of the preëngagement of any of the equipment or material posted.

(3) A special notice of some unexpected use of certain equipment, not scheduled, stating where and for how long the material will be in use.

(*c*) *Group* or *classroom* ownership is but little trouble. "Turn about" is the rule for both small groups and individuals. Individual tasks or division of work on group projects will help to do away with overlapping needs; when these needs do arise, adjustments are easily made by the children.

(*d*) Material owned by the *individual* child is cared for by the owner, who uses it at need and replaces it in assigned place.

3. *Children's Responsibility for Care and Use*

As noted elsewhere, all school material must be kept in good condition, in order, and in an assigned place where it may be easily located and used when needed. Who shall do this and how the plan shall be managed are important matters.

(*a*) The burden of this care should fall on the children, for both practical and educational reasons. The teacher's time is always too overcrowded for her to keep up with all the work material. On the other hand, this same responsibility, properly graded and divided among the children, provides some of the real problems that it is so good for a school to have. Children can really do much more than most parents or teachers realize or allow, and they respond to confidence in a surprising way. This is true not only of the way they assume responsibility, but of the really efficient and satisfactory way that they carry out what they undertake. Of course at times they need for certain tasks instruction in technique and some supervision; also they must be allowed frequent conferences with the teachers. Granted this:

(1) Such tasks as cleaning and sharpening tools, dusting and arranging material, mending and working over books, pictures, specimens, music, pamphlets, are quite possible.

(2) The children also distribute and return material — phonograph, scales, books, handwork, pencils — and perform other work such as is suggested elsewhere in the text.

(3) Older children are usually delighted to take over some of the primary children's tasks which they find too difficult, like mending books or sharpening tools.

(*b*) Organization is the only practical means to a successful

outcome, the organization growing in detail as the children perceive, through experience, the different needs and requirements.

(1) Teachers and children plan together all the details of what must be done, why it must be done, how it should be done and who shall do it.

(2) After that the children are responsible. Of course, no youngster should be given a duty too hard for him; great care is needed here. But even the newest first-grader can do something, and the task once his *is* his, not any one else's. After this is clearly understood there should be no coaxing, reminding, or helping on the part of the teacher or of any one else. A failure in dependability is far worse than a failure in arithmetic. Public opinion may be so molded along those lines that removal from a post of duty will be a real punishment. A word of caution is due here: be careful about the nervous or overconscientious child who takes responsibility too hard.

(3) Committees are of many kinds, and consist of one child or several children. The teacher may be consulted when needed. If the victrola belongs to the school a schedule must be arranged. Each group has its own special time and a committee of older children in charge will see that all hold to the schedule. The costume box is locked, and only the holder of the key may give out the contents; he also sees that things are returned. If the need arises, committees are appointed for such work as mending books and pictures and cutting paper and cardboard for stock. The committee to keep things clean in and out of doors is a large one, and every room is represented in it. Regular duties, such as keeping material in order, dusting, keeping tools sharp and clean, require for their oversight regular committees or else an individual child appointed from the group who owns the material.

(*c*) The above plan has been tried in whole or in part by many schools, and after a little patient effort in starting the machinery it is likely to prove quite practical and most satisfactory. In this, as in other try-outs, there should be a gradual introduction of the method, each step evolving from some particular need that the children feel. The following suggestions are made or reëmphasized.

(1) Begin on the first day of school; an immediate attack on any problem is best.

(2) See that every child has always some task, however small.

(3) Help the children to find what the various needs are and to see the value of organization; and lead them to make suggestions for better work plans.

(4) Have small committees (two to four children) as a general thing, though with small children the individual task is often best.

(5) Do not change the work too often. When this is done children are likely to forget or to become confused, and so is the teacher.

(6) Post all assigned work or lists of committees on the bulletin board or in some other approved place, for reference at any time. This saves time and talk, and settles all disputes and misunderstandings, and all questions of responsibility.

(7) Hold the children responsible, otherwise the teacher takes on extra burdens and the children gain nothing.

II. STORAGE PROBLEMS

a. Where to Keep Material and Equipment

A place to keep school equipment is all-important. Each school has its own special conditions and handicaps to overcome. This problem of storage, or taking care of equipment, has three divisions.

First: such stock equipment as crayons, ink, paper; and commonly owned things such as the paper cutter and the phonograph; books, collections, maps.

Second: the group or classroom material (tools, paste, wood blocks).

Third: the individual child's own work and possessions.

In working out these three phases of the problem in a practical way the type of material must be considered. For example, pictures and books require less space than most constructive material. The organization and arrangement of materials must be determined by general school conditions — the number of rooms, children, and teachers, and other factors.

All types of storage equipment are used: closets, cupboards, cases, shelves, large and small boxes, racks, and other special devices, as well as smaller containers.

The amount of space necessary for storage varies so greatly that

no definite requirement can be given. A minimum essential would certainly include for *general school-storage* purposes, a cupboard or closet at least 4 feet wide, 3 feet deep, and 6 to 8 feet high; and for *classroom* material shelf space at least 48 feet long by 12 feet wide (arranged as desired), and also one cabinet or cupboard section 24 inches high, 26 inches wide, and 36 inches long, for bulky materials and large sheets of paper. This does not include children's compartments. In many cases specific plans are given with each material. Other plans are suggested, as follows, which include the storage equipment, the problem of placing it, and a few suggestions for arranging the materials in a convenient and economical way.

1. *Closets*

Closets, large or small, will take care of stock or classroom materials, according to location.

(*a*) New space may be enclosed (p. 337) or existing closets refitted.

(*b*) Shelving plans are most important, since with careful arranging the same space can be made to accommodate much more material. Graduated shelves are very satisfactory; the use of them makes the material much easier to handle and find. A free section is left between first shelf and the floor.

(1) For very shallow closets the following plan is suggested:

First shelf, 30 inches from floor, the full length or full width of the closet if doors are wide, or as wide as is possible, when standing room must be provided for inside the closet.

Second shelf, 10 to 12 inches above the first shelf and about three fourths as wide as the first shelf.

Third shelf, 10 inches above the second shelf and about one half as wide as first shelf.

Fourth shelf, 10 inches above the third shelf, of full width, or as wide as the first shelf.

(2) For larger space there is some variation:

First shelf, 18 to 24 inches, built across both sides and the back of the closet.

Other shelves, about the same spacing and width as indicated above, with an extra very narrow shelf (2 to 4 inches) fitted in between the wider shelves.

(*c*) Certain devices will help greatly (p. 336).

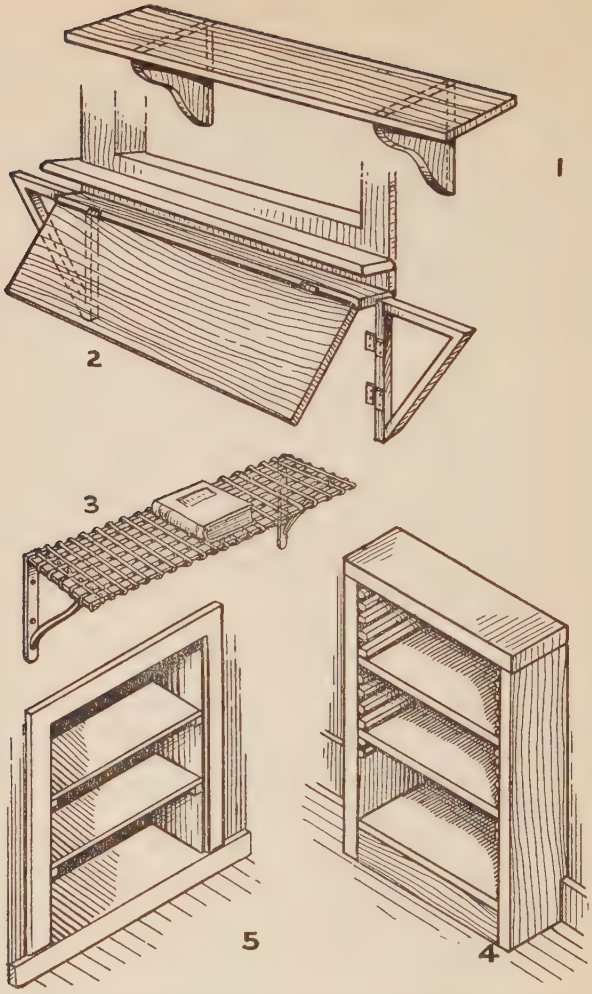


FIG. 12. SUGGESTIONS FOR DIFFERENT KINDS OF SHELVES

1. Single shelf. 2. Folding or drop shelf.
3. Shelf of quarter-inch wire screening.
4. Built-in shelves, projecting into room.
5. Built-in shelves, flush with wall.

2. *Shelves*

Shelves may be single or in sections, fixed, adjustable, or folding, and made of wood, wire screening, plate glass, or metal.

The wooden shelf is for most needs about three quarters of an inch thick and, unless very wide, made of a single board.

The wire-screen shelf is sometimes used for holding light-weight materials, such as nature specimens or other collections; also, in coat rooms, for holding overshoes, coats, and lunches. A one-fourth inch mesh, from any hardware store at a few cents a square foot, is used. This is stretched tight over shelf brackets and fastened with small brads. The wire should be cut the desired width at the store.

Small metal shelves are sometimes used for heavy objects (like the dictionary). These are purchased from A. Flanagan and other supply houses.

Plate-glass shelves are used chiefly in display cases; they are very expensive. They can be obtained from local builders or contractors.

(*a*) *Open shelves* in sections are the easiest and least expensive forms of storage space, and can be put in by older children with a little help. The best use of such shelves really is for books, nature material, and some of the work materials, but they can be used for most kinds of equipment if the room is secure. Curtains are not advised. Where the materials show they should be in order and in attractive boxes, jars, or other containers. Doors may be added at any time by a skilled workman.

(1) The width of the shelf and the distance between the shelves vary with the need. For general use, 10 inches in width is about right with 10 inches between shelves. Specific suggestions follow:

For books — 9, 10 or 11 inches; 10 to 12 inches spacing.

For toys and material — 12, 14 or 18 inches; 10 to 16 inches spacing.

For museum — 6 to 14 inches; 10 to 16 inches spacing.

For small objects — 4 to 6 inches; 5 to 6 inches spacing.

For children's compartments —12 to 14 inches wide (p. 334).

(2) The number of shelves in a section depends upon the need, the available space, and the placing in the room.

(3) The height of the section varies from 26 to 60 inches, according to the size of the children, and the use of the section.

(4) Adjustable shelves resting on cleats (nailed on each side to the wall or to the frame of the shelving), or on library shelf-pins (from Gaylord's, at 25 cents a dozen, or $8\frac{1}{2}$ cents per shelf) are best for books, museum collections, and general use. Cleats or shelf-pins should be placed from 3 to 6 inches apart.

(5) Fixed shelves are best for handwork material, supplies, and all heavy articles. They should be nailed or screwed firmly into place.

(*b*) *Drop or folding shelves* are invaluable when floor and table space is limited, since they may be used as temporary tables for reading, writing, or handwork, and for holding exhibits, or nature specimens, and when not in use can be dropped flat against the wall. They are placed under windows, along walls, and, if other space is lacking, under blackboards. Their height is determined by the use to which they are to be put. The shelf can be hinged on to the wall with an adjustable prop, or folding metal brackets can be used. These come in several sizes and weights, from most hardware stores (S and S. Hardware Company, Inc.), and are advised.

(1) The *cost* of a pair of folding brackets is from 50 cents to $2.50; size 16 × 18 in. is $2.25; 14 × 16 in., $1.65; 12 × 12 in., 85 cents; 8 × 8 in., 70 cents.

(2) The *size* of the brackets depends upon the width of the shelf and the weight to be supported. When the shelf is to be used as a table for children's work, have the largest size.

(3) To *put up* these shelves, fasten the brackets to wooden strips nailed to joists in the wall. Then screw the shelf board to the arm, which should be within two inches (for heavy objects) to six inches (light objects) of the width of the shelf. Place the brackets from $3\frac{1}{2}$ to 5 feet apart, according to the weight which the shelf must support and about 10 to 12 inches from each end.

(4) Paint both wood supports and brackets the color of the wall to which they are attached.

(*c*) *Single fixed shelves* serve other needs, and are usually placed on the wall, at the window, and occasionally (made very narrow) above the blackboard.

(1) The single shelf used on the wall is 8 to 10 inches

wide, placed about $4\frac{1}{2}$ to 5 feet from the floor; the window shelf may be 8 to 14 inches wide, placed 2 inches below the sill ledge.

(2) Wooden brackets are most attractive. The rigid iron brackets may be used. They cost from 15 to 50 cents a pair from any hardware store or mail-order house.

3. *Built-in Cupboards or Cabinets and Cases*

Cupboards and cases with doors are needed for materials which require security and protection from dust and mice. If possible, build in flush with the wall (that is, back into partition space) to save floor space.

The simplest and least expensive cupboards are made by adding doors to built-in shelving, without using extra floor or walls. Window screening tacked securely at the back and coming well over on the floor and sides will keep out rats and mice, if the doors fit closely. A more substantial but also more expensive type has complete walls and floor of its own.

Doors for cupbroads or cases may be sliding or on hinges. Sliding doors are advisable where floor space is crowded. Glass doors are best for show cases, but are expensive.

Shelves or drawers (p. 335) are used when needed. Drawers need a skilled workman.

Dimensions must be planned according to the place to be occupied. The Library Bureau will supply blue prints for some of this equipment. Investigate.

A few suggestions follow:

(*a*) *A large cupboard*, approximately 4 feet wide, 3 feet deep, 6 to 8 feet high, properly planned, will take care of a large amount of material. Shelves, swinging racks (p. 336), open space for bulky articles, may all be included according to special needs, as just suggested for closets.

(*b*) *Smaller cupboards* may be built along walls or in other available space (p. 337). They may be divided into shelves or compartments, or space may be left free, as desired. The tops offer a broad shelf for general uses.

(*c*) *Combination case-cupboards* have a lower base, 24 inches wide, with or without shelves and with wooden doors, while the upper parts have 12-inch adjustable shelves with glass doors. This kind of cupboard is a good place for museum collections or display material, and for storing equipment; the glass door may be omitted.

(*d*) *Exhibit cases* (wall) for halls or assembly rooms have preferably plate-glass shelves and sliding glass doors. In some cases wire-screen shelves have been used (see Shelves, p. 329). In the Lincoln School, Teachers College, these cases are 6 feet high, 11 feet long and 22 inches deep, are lighted by electricity, and have plate-glass shelves.

4. *Other Cases and Plans*

(*a*) *Movable open cases* with wall-board back, for storing material and also to serve as a screen or dividing wall, are used in most rooms. They are inexpensive and easy to make. Any dimensions may be used. A convenient unit is 36 inches long, 18 inches wide, and 34 inches high, with a dividing shelf in the middle; the lowest shelf is 3 inches from the floor. If it seems desirable, each shelf may be divided into 3 compartments, each 12×18, to be used for children's work. Heavy things, such as books and tools, should not be kept in these cases. The case should be light and easy to move; as many as are needed can be made. When several cases are used they should be placed touching one another, with the backs turned to the room. That arrangement makes them available for use as bulletin board, a drying board for pictures, or as a substitute for an easel to hold children's painting sheets.

(*b*) *Old sets of shelves, bookcases, secretaries,* and *chests of drawers* are welcome gifts, since most of them are strong and well made, with good drawers and locks. Remove from any article fancy tops, jigsaw ornaments, and legs, till only plain, straight, or curved lines are left. Remove the paint or varnish and finish to match the woodwork (see p. 286). Place the piece in exactly the right position in the room and fasten it to the floor or the wall with a few nails in order to give a flat, built-in effect, or else use it as a movable piece, as seems best. Broken glass in doors can be replaced with composition wall board (p. 77) or plain linoleum in dull colors, tacked inside the door frame.

(*c*) *Large packing boxes* of uniform height, nailed together and attached to the floor made acceptable cupboards for one school. Shelves were put into some of the boxes.

(*d*) *Filing cases* are essential.

Children's school records and teachers' notes, pamphlets, notes, lantern slides, post-cards, small pictures, victrola records, and sheet music are of value only if arranged in such a way that they can be quickly located and examined.

All filed articles should move freely and should slant sufficiently (about 45 degrees) to show plainly their name or nature.

Index cards, clearly printed, are used for guides. Keep all material in strict alphabetical order to third or fourth letters, as *Bars — Bart*. There is no other way to prevent losing things in the file. Return each thing promptly to the file after using it, as insisted on elsewhere. Upon this depends the whole success of any form of organization. A visit to a well-kept business office will prove helpful to a teacher who is a novice at filing.

(1) An office filing case, a combination unit which gives several sizes of drawers, is an excellent piece of furniture, but the cost ($100) is out of proportion to most school funds and so, as a rule, other plans are best.

(2) Boxes of the correct size are quite satisfactory. They may be constructed, or old boxes may be recut, covered, or painted. Cardboard cartons make excellent file cases. Close-fitting covers which slip on, or which are fastened to boxes with hinges or strips of cloth are required. The size of the box is determined by the contents. The sides of the box are cut slightly *lower* than the front and back, which should be higher than the level of the contents to prevent the cover from bending or crushing them. Have the box long enough to allow for growth in the volume of the material.

(3) Drawers in tables, cupboards, cases, if available may also be used for filing things.

(*e*) *Exhibit cases* (counter). For taking care of the museum-library exhibits, counter cases with glass tops are often most desirable. They may be of any size, with flat or slant tops, and will be made by a good carpenter or purchased (expensive) from the Library Bureau, which will also supply blue prints for local constructing.

5. *Boxes*

Large boxes, fixed or movable, serve many purposes. Movable (p. 335) or fixed partitions, sliding trays, even narrow shelves, will add to convenience in keeping materials separate and in good condition.

(*a*) *Built-in*, or stationary, boxes with hinged tops, set under windows, along walls in group or classrooms, or even in halls, are used for storage and may also serve as seats. They are excellent for surplus supplies, especially bulky materials (clay), or things easily broken (flower pots) or tipped over (paint), or for long articles (garden tools; wood supply).

This type of box may also be built under the blackboards if they are too high from the floor, and utilized for the children to stand on. In this case they should be low and narrow. This plan can be followed only in primary rooms, since in other rooms the arrangement would interfere with the older children's use of the boards. For general use a box 4 feet long, 17 inches high, and 15 inches wide is a good size. Proportions, however, should be worked out to meet the requirements of the space to be filled and the materials to be stored. Where the box is over 4 feet long, make the top in sections. If rats or mice are troublesome, the contents can be made safe by tacking wire screen on the wall at the back and well over on the framing and floor, also over cracks.

(*b*) *Movable* boxes are very useful.

(1) A box 4 to 6 feet long, $1\frac{1}{2}$ to 2 feet high, narrow enough to pass through doors, with a hinged top and lock, and on casters (Payson's patent casters, 184), is very convenient and is easily moved where and when desired. In it are kept costumes and decorative properties and materials (p. 192), an emergency couch with a thin mattress pad, sheets, pillow, and blanket (p. 267) or sewing materials. It is also useful in other ways. When closed, the box makes a good seat. It may be kept in the classroom, hall, or wherever it is used.

(2) Open boxes, deep or shallow, on wheels, are used for blocks, pieces of wood, or other material, especially in the primary grades. Any good wooden box will do, or a new box may be made. These boxes are attractive if painted in bright colors. Old wagon, bicycle, or kiddie kar wheels are used, or a 4-inch wheel may be purchased at about 95 cents per set of four at any hardware store. Wooden wheels are not usually strong enough, for they are likely to split under heavy weight.

6. *Compartments (or lockers) for Children's Work* (see also Shelves, Cupboards, and Cases in this chapter)

Each child needs a special place in which to keep his unfinished work, personal materials, and other possessions. This is quite as necessary for upper grades as for primary children. Even when desks are used, such arrangements are necessary in order to get the best results. It is important that each compartment be large enough to hold a good amount of material, and paper at least 12 by 18 inches in size. Individual compartments, each 16 inches

wide, 18 inches deep, and from 9 to 13 inches high fill the need of most grades. Many plans have been tried in different schools.

(*a*) *Shelving*, open or in cupboards, can be divided into the required spaces. Where expense is not too great an item, each compartment can have its door, which drops and lifts. Partitions may be of cardboard, wall board, or thin wood, and may be adjustable or fixed.

(1) Miss Moore, in *The Primary School*, suggests for the primary rooms (30 children) shelving (with or without doors) 26 inches wide, 18 inches deep, 20 feet long. The shelving is divided by a middle shelf 13 inches from the floor and by partitions 16 inches apart, into 30 compartments, each 13 inches high, 16 inches wide, and 18 inches deep.

(2) By making the height 27 inches and using two shelves 9 inches apart, each compartment will be 9 inches high instead of 13, and will serve 10 more children.

(3) By further increasing the height, the length of the section can be shortened. This plan is satisfactory to use for older children's accommodation.

(*b*) *Movable* cases (p. 332) will also serve if properly divided.

7. *Helpful Devices*

(*a*) *Drawers* are often convenient in cupboards, or in special sections in walls. They should always be built by good carpenters. Old drawers may be fitted into partition space or into cupboards.

(*b*) Movable or adjustable *partitions* which make possible different arrangements of space are most convenient. They may be used in boxes, drawers, filing cases, shelves, and cupboards. Wall composition board (p. 77) or even heavy cardboard may be used. These partitions fit between two narrow molding strips tacked in an upright position on wall or sides, about $\frac{1}{4}$ inch apart, or into grooves made with a gouger, and can be removed when not needed or changed from one groove to another.

(*c*) Swinging *frames* (see Fig. 13) which fold back flat against the wall or swing together, are excellent for storing or keeping in good condition such materials as charts, maps, posters, large unframed pictures, sheets of paper, children's work, and other large flat articles which may be rolled and labeled, or hung flat from hooks at the top. These frames are hinged on to a board nailed to

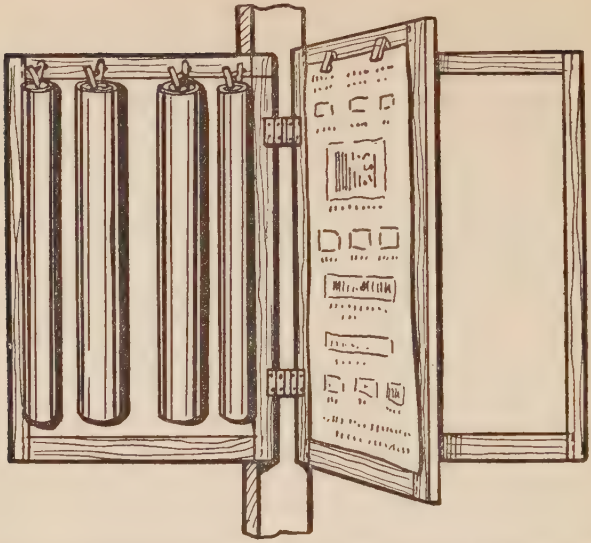


FIG. 13. SWINGING FRAMES FOR HOLDING CHARTS, PICTURES, ETC.

a cupboard wall, a door or even a screen unit, where they are not in sight and swing together as the folding bulletin boards do (see pp. 304, 306), taking up little space. The size and number of frames depend upon the use and space. Start with one or two, and add others as the collection grows.

(*d*) Certain household *devices* may also be used to advantage in closets, cupboards, or wherever convenient.

(1) A fixed rod or pole (used in closets for coat hangers) will take care of rolled or flat pictures, charts, and posters.

(2) A towel rack will hold lighter objects.

(3) Large harness hooks, 8 inches long (from hardware or mail-order firms for 15 cents) will support heavy weights, also a number of charts and pictures, rolled or flat.

(4) Wall pockets on doors, on walls of closets or sides of boxes will hold dust cloths, sewing scraps, tools, or other things.

(5) Nails or hooks on doors or on the walls of cupboards, between shelves, help with small articles in many ways.

(6) Very narrow shelves on the sides of built-in boxes hold small objects of varied kinds.

b. Where to Place Storage Equipment

1. *Built-in Features*

In regard to the placing of built-in features — boxes, lockers, closets, doors, blackboards — the proportions of room or hall, and the kind of material to be stored should always be considered.

(*a*) The following points should be kept in mind:

(1) Light is desirable.

(2) Convenience to children for seeing or using is important. Several small cupboards or shelves in different parts of the room are best.

(3) Openings to passages must not be blocked, nor the space in front of cupboards.

(4) Appearance should be considered.

(*b*) Economy of space (wall and floor) and the use of accidental or already existing wall depressions (alcoves, nooks) is urged.

(1) Partition space, that is, space between inner and outer walls, for drawers, shelves, display space, or cupboards, either in rooms or halls.

(2) Spaces under windows in classrooms for lockers, boxes, and shelves.

(3) Nooks, alcoves, corners of classrooms and halls for cupboards or shelves. Even an unused door, if it opens outward, will do for shallow shelves. The rear wall of the assembly hall will serve for cases or shelves.

(4) In wide halls the wall space on one or both sides will do for shelves or cases with glass doors or cupboards according to needs or uses.

(5) Space under stairs opened, or finished up, for closets (p. 327).

(6) The front end of the wall on the window side, for the lower cupboards or lockers.

(7) Space under blackboards (where the blackboards are too high) for low boxes (p. 333) with hinged tops, to be used for storage and for the children to stand upon.

(8) Partitions and fixed screens, with shelves or cupboard added on one or both sides.

2. *Movable Features*

These should be placed where convenient and moved from time to time (see following section, How to arrange materials).

c. How to Arrange Materials and Storage Equipment

1. *Convenience and Accessibility*

(*a*) Keep the *stock and commonly owned material* in a central place if possible.

(1) A stock room with suitable cupboards, shelves, and tables is desirable though seldom possible.

(2) A large closet or cupboard in the hall or the principal's office is usually possible and is the next best plan.

(3) Wall space in halls, assembly room, or principal's office may also be utilized for flat things (pictures, charts, etc.) and for narrow shelves or cases.

(4) Individual rooms must sometimes be used for taking care of part of this material, but only as a last resort.

(*b*) Keep the *special classroom materials* in the room or close at hand. Several small cupboards and shelf sections are better than one large cupboard.

(*c*) Keep *together* when possible the things which are used together or serve the same purpose.

(1) Tools, work bench, wood.

(2) Paint, brushes, paper easel or board.

(3) Posters, spreaders, paste cloths, gummed tape, tacks, glue, fasteners.

(4) Cleaning things — that is, brooms, dustpan, soap, powder, and cloths.

(*d*) *Separate* things which interfere with one another when in use or are not used together.

(1) Pencil sharpener and handwork supplies.

(2) Work bench and bulletin board and reading table.

(3) Cleaning equipment and unfinished handwork.

(4) Children's unfinished work and regular materials.

(*e*) Keep *large* heavy articles on the floor, on a low shelf, or in built-in boxes.

(*f*) Keep material that is used *often* in central shelves toward the front, and material that is seldom used on high shelves or at the rear.

(*g*) Keep the material used *most* by the children on low shelves within easy reach.

(*h*) Consider *where* materials are to be used.

(1) Garden — garden tools.

(2) Book shelves — reading table.

2. *Economy and utilization of storage space*

(*a*) Plan for all available space:

(1) Walls and doors fitted with hooks, racks, pockets, or other devices will care for many things — tools, string, toys, scissors, etc.

(2) Floor space will hold heavy or bulky material, such as clay.

(3) Well-placed shelves (pp. 327–331) will be of great help in making suitable arrangements.

APPENDIX

PART ONE — BOOK LISTS

Helpful References for Teachers

The following lists, in no sense final or full or best, contain a few worth-while books, pamphlets, and magazines which present different phases of the work. Each has been recommended by some specialist in the particular field that it covers, and has proved helpful to the working teacher. Inexpensive materials have been suggested when possible. Much of this material is now available through pamphlets or bulletins issued by various agencies (see Educational Addresses), and through advertising catalogues and circulars, which often give most helpful information and instruction of various kinds. Modern textbooks for children often contain valuable suggestions for teaching.

In view of the wealth of material now in print and the new and improved presentations that are constantly appearing from the presses, it is obvious that any list is inadequate and that every teacher should be on the lookout for additional help. Fuller bibliography may be found in all books on educational topics.

It is also worth while to any teacher to be on the following mailing lists:

1. U.S. Bureau of Education for *Publications Available; Monthly Review of Current Educational Publications.*

2. U.S. Department of Agriculture for *Monthly Notification of Available Publications.*

3. Your State Department of Agriculture; State Board of Health; State Library Commission; State Department of Education.

4. Publishers who specialize in children's books of all kinds.

It is well to note that pamphlets and bulletins are often issued in only one edition, which is soon exhausted, hence in many cases, in the following lists it seems best to refer to the publishing organizations, rather than to individual pamphlets. These various agencies will respond quickly to requests for price lists and will recommend special publications to meet the teacher's special need.

Of course no suggestion of plan or book applies as a whole. Each

teacher, supervisor, or principal adapts or selects for the local situation those things which are practical or possible.

Addresses not given with the references are found in Part Two of the Appendix. Note carefully the classification in various lists. All material in the Appendix is kept up-to-date.

The following classification, which follows in general the chapter organization, is used:

List I. General Curricular References
List II. History References
List III. Geography References
List IV. Science References
List V. Number: Arithmetic References
List VI. Constructive References
List VII. Language and Literature References
List VIII. Reading References
List IX. Writing References
List X. Art References
List XI. Music References
List XII. Play References
List XIII. Library and Book References
List XIV. Museum References
List XV. Picture References
List XVI. Excursions—Field Work Reference
List XVII. Buildings and Equipment References

List I. General Curricular References

1. Books and Pamphlets

*Bonser: The Elementary School Curriculum. Macmillan.

Collings: An Experiment with a Project Curriculum. Macmillan.

*Dewey: The Child and the Curriculum. University of Chicago Press.

*Dewey: Interest and Effort in Education. Houghton.

*Dewey: School and Society. University of Chicago Press.

*Goodlander: Education through Experience (pamphlet). Bureau of Educational Experiments. First Four Grades.

*Krackowizer: Projects in the Primary Grades. Lippincott.

Meriam: Child Life and the Curriculum. World Book Co.

*Moore: The Primary School. Houghton.

Parker and Temple: Unified Kindergarten and First Grade Teaching. Ginn.

Pratt: Experimental Practice in the City and Country School. Dutton.

Salisbury: An Activity Curriculum. Harr Wagner.

Wells: A Project Curriculum. Lippincott.

*Courses of Study from Progressive Private and Public School Systems. Write U.S. Bureau of Education (Washington) and Society for Progressive Education (Washington) for lists.

*Morning Exercises (pamphlet). Francis W. Parker School, Chicago, Ill.

*Some Uses of School Assemblies (pamphlet). Lincoln School of Teachers College, Columbia University.

**Studies in Education (pamphlets). Francis W. Parker School, Chicago, Ill.
Issued yearly. Nine volumes now available.

Yearbooks of National Society for Study of Education. Public School Publishing Co.
Twenty-Fourth Yearbook, Part II. Adapting the School to Individual Difference.
Twenty-Sixth Yearbook, Part I. Curriculum Making, Past and Present.

2. Magazines

*Childhood Education. Williams and Wilkins Co., Baltimore, Md.
For Kindergarten Primary Teachers.

Elementary School Journal. Department of Education. University of Chicago.

Journal of Educational Method. World Book Co., Yonkers, N.Y.

*Journal of Rural Education. 525 West 120th Street, New York, N.Y.

Normal Instructor and Primary Plans. Dansville, N.Y.
For untrained teachers.

**Progressive Education. 10 Jackson Place, Washington, D.C.
For a new point of view and news of the progressive movements in education.

School Life. U.S. Bureau of Education, Washington, D.C.

LIST II. HISTORY REFERENCES (see also Lists I, VI)

1. Books and Pamphlets

Booth: Material on Geography, free or at small cost (pamphlet). Eastern Illinois State Teachers College, Charleston, Ill.

*Dopp: The Place of Industries in Elementary Education. University of Chicago Press.

Dynes: Socializing the Child: A Guide to the Teaching of History in the Primary Grades. Silver Burdett.

Elyeking: Study Guides for Problems in American History. Harr Wagner.

Fox: How the World Rides (pamphlet). U.S. Bureau of Education.

Hartman: Home and Community Life. Dutton.

Judd and Marshall (editors): Lessons in Community and National Life. Series C (pamphlet). U.S. Bureau of Education.

Klapper: Teaching of History. Appleton.

*Vollintine: The Making of America. Ginn.

Wayland: How to Teach American History. Macmillan.

*Welling and Calkins: Social and Industrial Studies for Elementary Grades. Lippincott.

Publications of McKinley Publishing Co., Philadelphia, Pa.

Publications of State Historical Societies, Daughters of the American Revolution (Washington), and other organizations of patriotic or civic nature.

*The Course of Study in History (pamphlet). Francis W. Parker School, Chicago, Ill.
Reprints for each grade may be obtained.

2. Magazines

The Historical Outlook. McKinley Publishing Co., Philadelphia, Pa.

The Literary Digest. Funk and Wagnalls, New York, N.Y.

The News Outline. Loose-Leaf Education, Inc., 40 South Third Street, Columbus, O.
An elementary story of the news.

LIST III. GEOGRAPHY REFERENCES (see also Lists I, VI)

1. Books and Pamphlets

Aitchison and Uttley: Across Seven Seas to Seven Continents. Bobbs Merrill.

Barrows and Parker: Eurasia. Silver Burdett.

Barrows and Parker: Journeys in Distant Lands. Silver Burdett.

Barrows and Parker: The United States and Canada. Silver Burdett.

Booth: Material for Geography, free or at small cost (pamphlet). Eastern Illinois State Teachers College, Charleston, Ill.

**Branom: A Bibliography of Literature on the Teaching of Geography (pamphlet). Home Study Department, Clark University, Worcester, Mass.

Clark, Unit Studies in Geography. World Book Co.

*Fox: How the World Rides. U.S. Bureau of Education.

*Parkins: A Teacher's Manual to accompany the McMurry and Parkins Geographies (pamphlet). Macmillan.
Excellent bibliography for teachers and children.

Smith: Human Geography. Book I. People and Countries. Book II. Regions and Trade. Winston.

Publications of National Geographic Society.

The Course of Study (new) of the City of Rochester. Board of Education, Rochester, N.Y.

The Course of Study (new) of the State of New Jersey. State Department of Education, Trenton, N.J.

2. Magazines

Bulletin of the Pan-American Union, Washington, D.C.

Geographic News Bulletins. National Geographic Society, Washington, D.C.

Journal of Geography. A. J. Nystrom and Co., 2249 Calumet Avenue, Chicago, Ill.

National Geographic Magazine. National Geographic Society, Washington, D.C.

LIST IV. SCIENCE REFERENCES (see also Lists I, VI)

1. Books and Pamphlets

Booth: Material on Geography, free or at small cost (pamphlet). Eastern Illinois State Teachers College, Charleston, Ill.

Caldwell and Meier: Open Doors to Science: With Experiments. Ginn.

**Comstock: A Handbook of Nature Study. Comstock Publishing Co.

*Davis: School and Home Gardening. Lippincott.

*Fox: How the World Rides (pamphlet). U.S. Bureau of Education.

*Fox: Nature Study (pamphlet). U.S. Bureau of Education.

Good: Laboratory Projects in Physics. Macmillan.

Hodge: Nature Study and Life. Ginn.

Holtz: Nature Study. Scribner.

Smith: Everyday Science Projects. Houghton.

**Tibbett: Class Room Aquaria (pamphlet). Lincoln School of Teachers College, Columbia University.

Trafton: Teaching of Science in the Elementary School. Houghton.

Verrill: Pets for Profit and Pleasure. Scribner.

Bulletins on Gardening, Trees, Natural Resources, etc. U.S. Department of Agriculture, and U.S. Department of the Interior (Forecasting Bureau; Bureau of Education; Reclamation Bureau).

Farmers Bulletin 606. U.S. Department of Agriculture.

Publications of Comstock Publishing Company, Ithaca, N.Y.

Publications of such organizations as State Audubon Societies; Wild Flower Preservation Society; National Geographic Society; American Museum of Natural History.

**The Course of Study in Science (pamphlet). Francis W. Parker School, Chicago, Ill.

2. Magazines

*National Geographic Magazine. National Geographic Society, Washington, D.C.

Popular Mechanics Magazine. 200 E. Ontario Street, Chicago, Ill.

**The Nature Magazine. 1214 Sixteenth Street, N.W., Washington, D.C.

LIST V. NUMBER: ARITHMETIC REFERENCES
(see also Lists I, IV, VI)

Losh and Weeks: Primary Number Projects. Houghton.

McLaughlin and Troxell: Number Projects for Beginners. Lippincott.

Osburn: Corrective Arithmetic. Houghton.

Roantree and Taylor: An Arithmetic for Teachers. Macmillan.

Smith: Number Stories of Long Ago. Ginn.

Thorndike: New Methods in Arithmetic. Rand McNally.

Thorndike: The Psychology of Arithmetic. Macmillan.

Weeks: Socializing the Three R's. Macmillan.

Wilson: Motivation of Arithmetic (pamphlet). U.S. Bureau of Education.

Course of Study (Arithmetic) for Denver. Board of Education, Denver, Col.

Any modern text in Arithmetic.

LIST VI. CONSTRUCTIVE REFERENCES (see also Lists II, III, V, X)

1. General Books

Batchelder: Design in Theory and Practice. Macmillan.

**Bonser and Mossman: Industrial Arts for Elementary Schools. Macmillan.

Dobbs: Illustrative Handwork. Macmillan.

*Mathias: Beginnings of Art in the Public School. Scribner.

McKee: Purposeful Handwork. Macmillan.

Sargent: Fine and Industrial Arts in Elementary Schools. Ginn.

*Sargent and Miller: How Children Learn to Draw. Ginn.

Winslow: Elementary Industrial Arts. Macmillan.

Winslow: Organization and Teaching of Art. Warwick and York.

**Creative Expression through Art (symposium). Progressive Education Association.

*Studies in Education: Selections from Vols. III, VIII (pamphlets). Francis W. Parker School, Chicago, Ill.

Cement: Concrete

Lemos: Color Cement Handicraft. Davis Press, Worcester, Mass.

Seaton: Concrete Construction for Rural Communities. McGraw Hill.

Bulletins. (Investigate.) U.S. Department of Agriculture.

Advertising materials from dealers and makers of Cement.

Clay

Binns: The Potter's Craft. Van Nostrand.

Cox: Pottery. Macmillan.

Dyes

Grimball and Wells: Costuming a Play (chapter on Dyes). Century.

Pellew: Dyes and Dyeing. McBride.

Stevens: Classified List of Primary Furnishings (pamphlet). Ethical Culture School.
Recipes for Nature dyes.

Pamphlets on home dyeing. American Dye Corporation.

Leather

Michel: Leather Work (pamphlet). Manual Arts Press.

Bulletins on Leather Work. (Investigate.) Extension Department, U.S. Bureau of Home Economics.

Leaflets. (Investigate.) Industrial Arts Coöperative Service.

Lettering

Johnson: Writing, and Illuminating and Lettering. Pitman.

Wise: On the Technique of Manuscript Writing. Scribner.

The Arts of the Book, Bulletin, Metropolitan Art Museum.

Miscellaneous

Beard: Little Folk's Handy Book. Scribner.

Brigham: Box Furniture. Century.

Claudy: First Book of Photography. McBride.

Fletcher: Making Tin Can Toys. Lippincott. (Older boys only.)

James: Practical Basket Making. Flanagan.

Miller: Kites and Kite Tournaments. Manual Arts Press.

Polkinghorne: Toy Making in the School and Home. Stokes.

White: How to Make Baskets. Doubleday.

Yates: Boys' Book of Model Boats. Century.

Zerbe: Practical Mechanics for Boys. New York Book Co.

2. Magazines

Industrial Arts Magazine. 354 Milwaukee Street, Milwaukee, Wis.

School Arts Magazine. 35 Foster Street, Worcester, Mass.

List VII. Language and Literature References
(see also Lists I, VIII, IX, XII, XIII)

1. Theory and Method

Bryant: How to Tell Stories to Children. Houghton.

Bryant: Stories to Tell to Children. Houghton.

Curry-Clippinger: A Handbook for Teachers, Children's Literature (pamphlet). Rand McNally.

Esenwein and Stockard: Children's Stories and How to Tell Them. Home Correspondence School.

Hosic: An Elementary Course in English: A Syllabus with Graded Lists and References. Board of Education, Chicago, Ill.

Kready: A Study of Fairy Tales. Houghton.

*MacClintock: Literature in the Elementary School. University of Chicago Press.

*Mearns: Creative Youth. Doubleday.

*Moore: The Primary School. Houghton.

Troxell: Language and Literature in the Kindergarten and Primary Grades. Scribner.

*Studies in Education. Selections from Vol. VIII (pamphlet). Francis W. Parker School, Chicago, Ill.

2. Story Lists

Murray *et al.* Report of I.K.U. on Stories and Poems for First Grade. Milton Bradley.

Lists issued by Children's Departments of Public Libraries.

LIST VIII. READING REFERENCES (see also Lists I, VII, XIII)

Fay and Eaton: Instruction in the use of Books and Libraries. Faxon.

Huey: The Psychology and Pedagogy of Reading. Macmillan.

*Jenkins: Reading in the Primary Grades. Houghton.

*Moore: The Primary School. Houghton.

Pennell and Cusack: How to Teach Reading. Houghton.

Sawyer: Five Messages to Teachers of Primary Reading. Rand McNally.

Stone: Silent and Oral Reading. Houghton.

Reading in the St. Cloud Public Schools, Grades 1 to 6. Board of Education, St. Cloud, Minn.

LIST IX. WRITING REFERENCES (see also Lists I, VII)

Conard: Alphabet Cards for Beginners in Manuscript Writing. Scribner.

Freeman and Dougherty: How to Teach Handwriting. Houghton.

Moore: Handwriting: For the Broad-Edged Pen. Ginn.

Stone and Smalley: Manuscript Writing Lessons. Book Two, Teacher's Guide. Scribner.

Wise: On the Technique of Manuscript Writing. Scribner.

List X. Art References (see also Lists VI, XV)

1. Books

Cox: Art for Amateurs and Students. Doubleday.

Dow: Composition. Doubleday.
The best general book on design as a fundamental and universal basis for art work.

Fowler: A History of Sculpture. Macmillan.

Gardner: Art through the Ages. Harcourt Brace.

Goldstein: Art in Everyday Life. Macmillan.

Oliver: First Steps in the Enjoyment of Pictures. Holt.

Sargent: The Enjoyment and Use of Color. Scribner.
Well illustrated, interesting, but rather technical for the untrained teacher.

2. Magazines

*The Children's Bulletin (quarterly), Metropolitan Art Museum, New York, N.Y.

List XI. Music References (see also List XII)

*Coleman: Creative Music for Children. Putnam.
Wonderfully interesting type of music work where children make and use their own instruments.

*Coleman: Creative Music for Schools. Lincoln School of Teachers College, Columbia University.
Series of 5 booklets for grades 3–6 with directions for making certain instruments and other creative work in music.

*Cundiff and Dykema: A Handbook of School Music. Birchard.

*Surette: Music and Life. Houghton.

Community Music (pamphlet). Playground Association Committee. Birchard.

Creative Expression through Music. Progressive Education. Magazine, No. 1, Vol. IV. Progressive Education Association.

Studies in Education: Selections from Vols. I and III (pamphlets). Francis W. Parker School, Chicago, Ill.

LIST XII. PLAY REFERENCES (see also Lists VI, VII, XI, XVII)

1. General Theory

Cook: The Play Way. Stokes.

Johnson: Education by Plays and Games. Ginn.

Palmer: Play Life in the First Eight Years. Ginn.

Sies: Spontaneous and Supervised Play. Macmillan.

2. Equipment

Garrison: Permanent Play Materials for Young Children. Scribner.
Kindergarten and First Grade.

Hunt: A Catalog of Play Equipment (pamphlet). Bureau of Educational Experiments.

Leonard: Best Toys and their Selection (pamphlet). Leonard.

Pamphlets. (Investigate.) Recreation and Playground Association of America.

Playthings (pamphlet). Bureau of Educational Experiments.

The Environment for Creative Education. Progressive Education Magazine, No. 2, Vol. IV. Progressive Education Association.

3. Games

Bancroft: Games for the Playground, Home, School, and Gymnasium. Macmillan.

Elmore: A Practical Handbook of Games. Macmillan.

4. Puppets and Puppet Plays

Joseph: A Book of Marionettes. Huebsch.

*MacIsaacs: The Tony Sarg Marionette Book. Huebsch.

Stewart: The Land of Punch and Judy. Revell.

5. Dramatics

Arvold: The Little Country Theatre. Macmillan.

Chubb: Festivals and Plays. Harper.

Cook: The Play Way. Stokes.

Grimball and Wells: Costuming a Play. Century.

Mackay: Costumes and Scenery for Amateurs. Holt.

**Mackay: How to Produce Children's Plays. Holt.

*MacClintoch: Literature in the Elementary School. University of Chicago Press.

**Mitchell: The School Theatre. Brentano.

Taylor: Practical Stage Directing for Amateurs. Dutton.

Plays for children (lists). American Library Association.

Plays for children made by children (leaflets). Francis W. Parker School, Chicago, Ill.

Studies in Education. Selections from Vols. I, III, VIII (pamphlets). Francis W. Parker School, Chicago, Ill.

List XIII. Library and Book References

1. General Books and Pamphlets

Bamberger: The Effect of the Physical Makeup of a Book upon Selection. Johns Hopkins Press, Baltimore.

Clinedinst: Library Work in the Schools of York, Pa.; the York Plan. The Public Library, York, Pa.

Eaton: The Lincoln School Library (pamphlet). Lincoln School of Teachers College, Columbia University.

*Fay and Eaton: Instruction in the Use of Books and Libraries. Faxon.

Rice: Lessons on the Use of Books and Libraries. Rand McNally.

Wilson: School Library Management. H. W. Wilson Co.

*Outline for Instruction in the Use of Books and Libraries in the Cleveland Public Schools. Cleveland, O., Public Library.

Pamphlets (investigate) of the American Library Association; Elementary School Library Standards; Planning the School Library; School Library Service.

Plans, blue-prints, and photographs of existing school Libraries. Library Bureau.

2. Selected Lists for the Children's Reading: Bibliography

Eaton: Books for Vacation Reading (pamphlet). Lincoln School of Teachers College, Columbia University.

*Hartman: The Child and his School. Dutton.
Full lists of content books. Excellent classification.

Horton: Outdoor Books for Boys and Girls (pamphlet). Women's Industrial and Educational Union.

Hunt: International Friendship through Children's Books (leaflet). League of Nations Association, 6 E. 39th Street, New York, N.Y.

Hunt: What shall we Read to the Children? Houghton.

**Hunt, Hopkins, and Mathiews: The Book Shelf for Boys and Girls (pamphlet). R. R. Bowker.
Kept up-to-date. Yearly editions.

Jordan: Children's Interest in Reading. University of North Carolina Press, Chapel Hill, N.C.

*Moore: The Primary School: Appendix. Houghton.
Excellent classroom selection.

**Terman and Lima. Children's Reading. Appleton.

*Books to Grow on (pamphlet). Buffalo Public Library, Buffalo, N.Y.

*Graded list of books for children. American Library Association.

Lists issued by Children's Departments of Public Libraries. (Investigate.)

3. Magazines

Libraries. The Library Bureau, 216 W. Monroe Street, Chicago, Ill.

The Library Journal. R. R. Bowker Co., 62, W. 45th Street, New York, N.Y.

List XIV. Museum References

*Farmers Bulletin 606. U.S. Department of Agriculture.

*Publications (investigate) of Newark, N.J., Museum; Metropolitan Museum of New York; American Museum of Natural History.

List XV. Picture References (see also List X)

1. Books and Pamphlets

Burrage and Bailey: School Sanitation and Decoration. Heath.

*Dana: Large Educational and Decorative Pictures. Newark, N.J., Museum (pamphlet).

Ellis and Thornbough: Motion Pictures in Education. Crowell.

*A Guide to the Study, Sources, and Materials of Educational Moving Pictures (pamphlet). National Child Welfare Association.

2. Magazines

Visual Education. Society for Visual Education, Chicago, Ill.

List XVI. Excursions — Field Work References

Finley and Tibbitt: Field Work (pamphlet). Lincoln School of Teachers College, Columbia University.

Excellent suggestions for both trips and the school work that grows out of them. While the experiences are those of a city school with all conveniences, many basic suggestions are given which are applicable to other schools.

Lutz: Nature Trails. An Experiment in Outdoor Education (pamphlet). American Museum Press, N.Y.

Miscellaneous Publications No. 21 of the American Museum of Natural History.

List XVII. Buildings and Equipment References

1. Buildings

Ayres, Williams, and Wood: Healthful Schools. Houghton.

Burrage and Bailey: School Sanitation and Decoration. Heath.

Cooper: Report on School House Planning (pamphlet). National Education Association.

Donovan *et al.*: School Architecture: Principles and Practices. Macmillan.

Dressler: American School Buildings (pamphlet). U.S. Bureau of Education.

Strayer and Engelhardt: Standards for Elementary School Buildings (pamphlet). Bureau of Publications, Teachers College, Columbia University.

Wood: Ventilation of School Buildings (leaflet). National Education Association.

Reports and Bulletins of various State Departments of Education.

2. Equipment

Dunn: Educative Equipment for Rural Schools (pamphlet). Teachers College, Columbia University.

Loomis: School Equipment Costs. Bureau of Publications, Teachers College, Columbia University.

Moore: The Primary School (Appendix). Houghton.

Newbury: Modern Equipment for One Teacher Rural School (Leaflet No. 3). U.S. Bureau of Education.

Stevens: A Classified List of Primary Furnishings, Apparatus and Materials (pamphlet). Ethical Culture School.

Strayer and Engelhardt: Standards for Elementary School Buildings. Bureau of Publications, Teachers College, Columbia University.

Report of Committee on Equipment for Kindergarten and Primary Grades. International Kindergarten Union, Washington, D.C.

The Housing and Equipment of Kindergartens (pamphlet). U.S. Bureau of Education.

PART TWO

LISTS OF ADDRESSES—SOURCES OF MATERIALS

EDUCATIONAL AND BUSINESS

THE following addresses have been carefully compiled, but the lists are necessarily incomplete. It must also be kept in mind that firms change, go out of business, or move; many of the larger firms have agencies in all the large cities and a letter to headquarters will bring the local or nearest address. For further help in locating unknown or incomplete addresses see "Where to Obtain Addresses," p. 320–21.

The following classification is used:

A. Educational Addresses

List I. Organizations
List II. Libraries
List III. Museums
List IV. Schools

B. Business Addresses

List V. Buyers' Guide
List VI. General Book Sellers
List VII. Mail-Order Houses
List VIII. School-Supply Houses
List IX. Science-Supply Firms
List X. Oriental Dealers
List XI. Travel and Tourist Bureaus and Agencies
List XII. Book Publishers
List XIII. Individual Firms

A. EDUCATIONAL ADDRESSES

LIST I. ORGANIZATIONS

American Association of University Women, The, Washington, D.C.
Pamphlets on Education; child welfare.

American Child Health Association, The, 370 Seventh Avenue, New York, N.Y.
Issues posters, pamphlets, and bulletins.

*American Federation of Arts, The, 1741 New York Avenue, Washington, D.C.
Sends rent collections of pictures, textiles, craftwork, slides.

American Library Association, 86 East Randolph Street, Chicago, Ill.
Books, book lists, pamphlets on library work. Advise on Library problems.

Bureau of Educational Experiments, 144 West 13th Street, New York, N.Y.
Publishes studies and reports dealing with special needs of child nature and growth, and with the related problems of education in home, school, and community. Inexpensive, up-to-date, excellent material for the teacher who wishes to follow the new movements in education.

Children's Foundation, The, Valparaiso, Indiana, 250 Park Avenue, New York, N.Y.
Valuable material for parents and teachers.

Child's Study Association of America, 509 W. 121st Street, New York, N.Y.
Pamphlets, Study materials.

**Industrial Arts Coöperative Service, 519 W. 121st Street, New York, N.Y.
Has helpful pamphlets (Industrial Art Studies; directions and recipes for tanning skins, making candles, beet sugar, etc.) at low cost. Purchases industrial art supplies for members; selects and purchases artistic specimens of china, textiles, etc.; recommends books, and gives other valuable help. Membership, $3.00. Strongly recommended. Send self-addressed, stamped envelope for information.

Junior Achievement Bureau, The, 168 Bridge Street, Springfield, Mass.
Gives, free of charge, excellent suggestions for practical handwork and for sets of equipment for it.

Marionette Theatre Exchange, The, 145 West 45th Street, New York, N.Y.
Gives information of marionette shows on tour; prices; how to obtain. Also where marionettes can be purchased, made, etc., and plays obtained.

National Child Welfare Association, Inc., 70 Fifth Avenue, New York, N.Y.

Has colored pictures and pamphlets on health and educational social topics.

**National Committee for Mental Hygiene, The, 370 Seventh Avenue, New York, N.Y.

Publishes splendid material on all phases of mental health and handles the problem of the slow, abnormal, unbalanced, peculiar, or nervous child in the most scientific and practical manner. Every teacher should be in touch with this organization.

**National Geographic Society, The, Washington, D.C.

Publishes pictures, books, reprints from magazines, pamphlets and a magazine; most helpful material for Geography, History, and Science.

National Tuberculosis Association, 381 Fourth Avenue, New York, N.Y.

Sends out films, posters, slides, educational campaigns suggestions, instructions, etc.

**Playground and Recreation Association of America, 315 Fourth Avenue, New York, N.Y.

Gives full information about all forms of educational play, including equipment, athletics, community activities, home playgrounds and playrooms. It has a Bureau of Music to aid Community Singing, orchestras, and other musical groups; a Bureau of Educational Dramatics which helps with pageants, plays, special-day programs and all similar needs; and issues pamphlets, leaflets, mimeographed material, at a nominal price — 1 cent to 25 cents.

**Progressive Education Association, 10 Jackson Place, Washington, D.C.

An association of professional workers and laymen, organized for the purpose of promoting and extending modern methods of education. Publishes valuable pamphlets, leaflets, and other material. Also publishes Progressive Education — a quarterly review of the newer educational tendencies in both public and private schools

and abroad. Membership, including magazine, $2.00 yearly.

*State Departments of Education and of Health of individual States give all kinds of information and help.

*State Library Commissions or Extension Agencies of individual States send out books to schools and individuals on request, and coöperate with schools in many ways.

**The United States Government, Washington, D.C.
Issues, through its many bureaus and departments, many helpful bulletins, pamphlets, and leaflets for teachers; also lends educational slides and films to schools; specific questions will be answered and advice given on school problems not covered in bulletins. Departments of the Interior (Bureau of Education, Reclamation, Indian Bureau, Bureau of Forestry, etc.), of Commerce and Labor (Children's Bureau, etc.), of Agriculture (Bureau of Home Economics, Farm Bureau, etc.), will supply single copies of most bulletins desired. The Superintendent of Documents, Government Printing Office, Washington, D.C., will supply quantity orders and special bulletins. The Smithsonian Institution also has valuable materials for teachers.

Wild Flower Preservation Society, Washington, D.C.
Pamphlets; post cards; magazine.

Women's Educational and Industrial Union, 270 Boylston Street, Boston, Mass.
Books, lists, pictorial maps. Also maintains a teachers' bureau for progressive schools.

List II. Libraries

The libraries that follow issue book lists, story lists, news bulletins, and other helpful material about books, pageants, exhibits, etc., free or at small cost (5 to 25 cents). Send stamp for list or answer to specific inquiries.

The Carnegie Library of Pittsburgh, Children's Department, Pittsburgh, Pa.

The Chicago Public Library, Children's Department, Chicago, Ill.

The Cleveland Public Library, Children's Department, Cleveland, Ohio.

The Newark Public Library, Children's Department, Newark, N.J.

The New York Public Library, Children's Department, New York, N.Y.

List III. Museums

The following publish many helpful bulletins, sell pictures, post cards, etc., and many distribute other material of great value to schools. Send stamped, self-addressed envelope for information.

American Museum of Natural History, The, New York, N.Y.
Most valuable pamphlets, pictures, etc.

Chicago Art Institute, Chicago, Ill.
Has a lending collection of photographs, color prints, post cards, lantern slides; on sale, post cards, plain-colored, pictures, plain-colored.

The Children's Art Center, Boston, Mass.
Is doing some very interesting work in Art Education and will send lists of art books and pictures, and suggestions for art exhibits for children.

The Metropolitan Museum of Art, Henry W. Kent, Secretary, New York, N.Y.
Has lending collections, cinema films, lantern slides, paintings, textiles, facsimiles of famous prints, photographs, post cards, casts, maps, charts, and electrotype reproductions of ancient coins -- all especially adapted to the use of teachers and lecturers. For the loan of these objects terms and conditions will be given on request. On sale: pictures, large and small, colored and plain, etched; specimens and casts; carvings.

The Public Museum, Newark, N.J.
Has a remarkable picture collection and fine industrial material and publishes most helpful bulletins. From time to time novel exhibits are sent out.

List IV. Schools

These progressive schools publish helpful material; write for catalogues or price lists, or state specific needs. Send stamped self-addressed envelope for reply.

Ethical Culture School, 63d Street and Central Park, West, New York, N.Y.

Francis Parker School, The, 330 Webster Avenue, Chicago, Ill.

Lincoln School of Teachers College, The, 425 W. 123d Street, near Amsterdam, New York, N.Y.

Park School, The, Baltimore, Md.

B. BUSINESS ADDRESSES

IMPORTANT NOTE: Before ordering *any material of any kind*, write for detailed information as to prices, terms, shipping rates, weight, guarantee, and latest catalogue, since conditions change quickly. Remember that *addresses also change frequently.*

LIST V. BUYERS' GUIDES

American Digest of Business Machines, American Exchange Service, 35 S. Dearborn Street, Chicago, Ill. A list of all types of machines.

American Educational List (recent edition). Publishers' Weekly, New York, N.Y.

American School Board Journal, Bruce Publishing Co., Milwaukee, Wis. $3.00 a year. Of practical help in obtaining modern equipment and material.

Davison Textile Blue Book, Manufacturer of all types of textiles and equipment for making textiles. Davison Publishing Co., Union Square, New York, N.Y.

Direct Advertising, a trade magazine with paper samples and addresses of paper dealers all over the country. Published by Paper Makers' Advertising Club, 142 Berkeley Street, Boston, Mass. Examine at local printer's.

Red Book, The, a School Buyers' List, very full, classified material. C. F. Williams & Son, 36 Beaver Street, Albany, New York. $.50. Specially recommended for needed addresses of dealers in all kinds of school supplies and equipment.

Sweet's Catalogue of Building Construction Materials, Sweet's Catalogue Service, 15 W. 40th Street, New York, N.Y.

Thomas's Register, American Manufacturers and First Hands. Thomas Publishing Company, New York, N.Y.

List VI. General Book Sellers

*Baker & Taylor Company, The, 35 Fifth Avenue, New York, N.Y. Discounts to teachers.

Graham, John W., 788 First Avenue, Spokane, Washington. (State.)

McClurg, A. C., Chicago, Ill.

*The Reagil Co., Inc., Dept. A-12, 120 W. 32d Street, New York, N.Y.

Stationers Coöperative, Los Angeles, Cal.

Wanamaker, John, Philadelphia, Pa.

List VII. Mail-Order Houses

Sears, Roebuck & Company, Chicago, Ill.

Montgomery Ward, Chicago, Ill.

List VIII. School-Supply Houses

Bradley Company, Milton, Springfield, Mass. Also offices in Boston, New York, Philadelphia, Atlanta, San Francisco, and other cities.

Clanton & Webb Company, 147 Whitehall Street, Atlanta, Ga.

Dobson-Evans Company, The, 305–7 N. Front Street, Columbus, Ohio.

*Fife Corporation, R. A., Mamaroneck, N.Y.

*Flanagan Company, H., Chicago, Ill.

*Hammett Company, J. L., Newark, N.J., Springfield, Mass.

Ideal School Supply Company, Chicago, Ill.

Northwestern School Supply Company, Minneapolis, Minn.

Northwestern School Furniture Company, Maritime Building, Seattle, Washington (State).

Prang Education Company, New York, Chicago, and other cities.

List IX. Science-Supply Firms

Catchpole, A., Naturalist, 625 Amsterdam Avenue, New York, N.Y.

Chicago Apparatus Company, The, Chicago, Ill.

Central Scientific Company, The, Chicago, Ill.

Geography Supply Bureau, The, Ithaca, N.Y.

Root Company, The A. I., Medina, O.

Ward's Natural Science Establishment, 84 College Avenue, Rochester, N.Y.

List X. Oriental Dealers

Fujiyama, The, 449 South Broadway, Los Angeles, Cal.

Gunn and Latchford, 261 Fifth Avenue, New York, N.Y.

Matsumoto Print Works, Nagoya, Japan. Duty must be paid.

Quang Tsu Lung (Chinese), 130 Plaza, Los Angeles, Cal.

Quong, S. P. (Chinese), 1016 S. Hill Street, Los Angeles, Cal.

Shima Japanese Art Store, 20 W. 46 Street, New York, N.Y.

Sing Fat (Chinese), San Francisco, Cal.; Santa Barbara, Cal.; San Diego, Cal.

Vantine's Oriental Stores, New York, N.Y.

Yamanaka and Company, 680 Fifth Avenue, New York, N.Y.

Yomati, The (Japanese), 404 S. Broadway, Los Angles, Cal.; San Francisco, Cal.

List XI. Travel and Tourist Bureaus and Agencies

Colored posters and booklets of great artistic worth, at low cost (25 cents to $1.50), are distributed to schools by the following agencies as long as their supplies, which are limited, hold out. No children need apply. Investigate.

Great Western Railway of England and Wales, 505 Fifth Avenue, New York, N.Y. (lists).

Italian Tourist Office, 749 Fifth Avenue, New York, N.Y.

London Electric Railway, Publicity Manager, 55 Broadway, Westminster, London, S.W. I. (lists).

London Midland and Scottish Railway, 200 Fifth Avenue, New York, N.Y. (lists).

Norwegian Government Railways; Travel Bureau, 342 Madison Avenue, New York, N.Y.

South Manchuria Railway Company, 342 Madison Ave., New York, N.Y.

Swedish State Railways; Travel Information Bureau, 52 Vanderbilt Avenue, New York, N.Y.

Swiss Federal Railways, 241 Fifth Avenue, New York, N.Y.

List XII. Book Publishers

Appleton, D., & Co., 29–35 West 32d Street, New York, N.Y.

Birchard, C. C., 221 Columbus Avenue, Boston, Mass.

Bobbs-Merrill Company, University Square, Indianapolis, Ind.

Bradley, Milton, Company, 49 Willow Street, Springfield, Mass., etc.

Brentano's, 5th Avenue, and 27th Street, New York, N.Y.

Bureau of Publications of Teachers College, Columbia University, New York, N.Y.

Century Company, 353 Fourth Avenue, New York, N.Y.

Comstock Publishing Company, Cornell Heights, Ithaca, N.Y.

Crowell, T. Y., & Co., 387 4th Avenue, New York, N.Y.

Davis Press, Worcester, Mass.

Doubleday, Page & Co., Garden City, Long Island, N.Y.

Dutton, E. P., & Co., 681 Fifth Avenue, New York, N.Y.

Faxon, F. W., Company, 83 Francis Street, Back Bay, Boston, Mass.

Ginn & Co., 15 Ashburton Place, Boston, Mass.; 2301–2311 Prairie Avenue, Chicago, Ill.

Harcourt, Brace & Co., 383 Madison Avenue, New York, N.Y.

Harper and Brothers, 49 E. 33d Street, New York, N.Y.

Harr Wagner Company, 149 New Montgomery Street, San Francisco, Cal.

Heath, D. C., & Co., 50 Beacon Street, Boston, Mass.; 321 W. 39th Street, New York, N.Y.; 623 S. Wabash Avenue, Chicago, Ill.

Holt, Henry, & Co., 1 Park Avenue, New York, N.Y.

Home Correspondence School, Springfield, Mass.

Houghton Mifflin Company, 2 Park Street, Boston, Mass.; 16 E. 40th Street, New York, N.Y.; 2500 Prairie Avenue, Chicago, Ill.; 1909 Bryan Street, Dallas, Tex.; 612 Howard Street, San Francisco, Cal.

Huebsch, B. W., 30 Irving Place, New York, N.Y.

Leonard, M. S., 2230 Van Hise Street, Madison, Wis.

Lippincott, J. B., Co., E. Washington Square, Philadelphia, Pa.

McBride, Robert M., 7 W. 16th Street, New York, N.Y.

McGraw-Hill Book Company, 370 7th Avenue, New York, N.Y.

Macmillan Company, The, 66 Fifth Avenue, New York, N.Y.

Manual Arts Press, Peoria, Ill.

Merrill, Charles E., Co., 432 Fourth Avenue, New York, N.Y.

New York Book Company, New York.

Pitman, Isaac, & Sons, 2 W. 45th Street, New York, N.Y.

Public School Publishing Company, Bloomington, Ill.

Putnam's, G. P., Sons, 2 W. 45th Street, New York, N.Y.

Rand McNally & Co., Rand McNally Building, Chicago, Ill.; 455 S. Olive Street, Los Angeles, Cal.

Revell Publishing Company, 158 Fifth Avenue, New York, N.Y.

Scribner's, Charles, Sons, 597 Fifth Avenue, New York, N.Y.

Silver, Burdett & Co., 329 W. 39th Street, New York, N.Y.; 217-223 Columbus Avenue, Boston, Mass.

Stokes, F. A., Co., 443–449 Fourth Avenue, New York, N.Y.

University of Chicago Press, Chicago, Ill.

Van Nostrand, D., Co., 8 Warren Street, New York, N.Y.

Warrick & York, Baltimore, Md.

Wilson, H. W., Company, 958 University Avenue, New York, N.Y.

Winston, John C., Company, 1006–1016 Arch Street, Philadelphia, Pa.

World Book Company, Park Hill, Yonkers-on-Hudson, N.Y.

LIST XIII. INDIVIDUAL FIRMS (referred to in text)

Abbott, A. H., & Co., 208 S. Wabash Avenue, Chicago, Ill.
Art Supplies.

Alabastine Company, The, Local firms: also Grand Rapids, Michigan (factory).
Calcimine.

Alanstand Cottage Industries, Asheville, N.C.
Mountaineer craft work.

American Crayon Company, Sandusky, O.; 130 W. 42d Street, New York, N.Y.; San Francisco, Cal.
Crayons, cement color (Petrona), show card colors.

American Dye Corporation, Port Chester, N.Y.

American Posture League School Furniture. See Barnet Phillips Company.

American Seating Company, 119 W. 40th Street, New York, N.Y.; 14 E. Jackson Street, Chicago, Ill.
School furniture.

Andrews Paper Company, 54 India Street, Boston, Mass.
Tissue towels.

Atkinson, Mentzer & Co., 24 West 39th Street, New York, N.Y.
Lithographs (Rhine Prints), school books, and other material.

Barnet Phillips Company, 101 Park Avenue, New York, N.Y.
School furniture approved by Posture League: Moulthrope Chair (seat and desk).

Baumgartner Company, J., Washington, D.C.
Printers' supplies; type outfit of all kinds.

Bausch & Lomb, Rochester, N.Y.
Stereopticons (ballopticons); magnifying glasses; aquariums.

Biltmore Industries, Grove Park Inn, Ashville, N.C.
Hand-woven homespun.

Binney & Smith Company, 41 East 42d Street, New York, N.Y.
Crayons, colored chalk, etc.

Bittel, Jacob, Liverpool, N.Y.
Willow baskets and furniture.

Book Publishers. See List XII.

Book Sellers (general). See List VI.

Boston Music Company; music publishers, Boston, Mass.

Boston Sculpture Company, Melrose, Mass.
Plaster casts; reproductions of famous sculpture.

Bowker Company, R. R., 62 W. 45th Street, New York, N.Y.
Pictorial maps, book lists; library journal, etc.

Brabham, J. W., Olar, S.C.
Cotton specimens in natural colors.

Bradley Company, Milton, New York, N.Y.; Springfield, Mass.; and other cities.
School supplies and furniture.

Brauneck, S. W., 32 W. 58th Street, New York, N.Y.
Tiles; Oriental prints; batiks; Persian and East Indian prints.

Broad Oaks Company, The, 527 California Terrace, Pasadena, Cal.
Blocks.

Brown-Robertson Company, 8–10 E. 49th Street, New York, N.Y.
Educational art publishers.

Builder Board Company, 4617 Beard Street, Minneapolis, Minn.
Blocks.

Burnam & Black, Syracuse, N.Y.
Work benches; manual training supplies.

Buyers' Guides. See List V.

Caproni, P. P., and Bros., 1920 Washington Street, Boston, Mass.
Plaster casts; reproductions of famous sculpture.

Catchpole, A., Naturalist, 625 Amsterdam Avenue (near 90th Street), New York, N.Y.
Fish; turtles; water plants, etc.

Central Scientific Company, Chicago, Ill.

Also

Chicago Apparatus Company, 701 W. Washington Boulevard, Chicago, Ill.
Apparatus and chemicals for Agriculture, Biology, Chemistry, General Science, Physics; minerals, soils, dyes, scales, etc. Catalogue not for general distribution, so write for information about particular need. Stock very full and complete; good values; reliable service.

Challenge Eyelet Press. See Sibley, Edward L.

Chase Stockinette Doll Company, Pawtucket, R.I.
Dolls.

Cherokee Indian Reservation, North Carolina.
Baskets; pottery.

Cizek Exhibit, The, Greenwich, Conn.
Color lithographs by children in Cizeks Art school in Vienna.

Comstock Publishing Company, Ithaca, N.Y.
Nature material of all kinds (specimens, books, pamphlets, note-books; star maps, etc.).

Cotton, N. C., Gallup, N.M.
Indian blankets.

Crane & Company, Topeka, Kan.
Tools; hardware.

Crescent Company, The, "Birdville," Toms River, N.J.
Everything for birds.

Czecho-Slovak Gift Shop, 100 West 44th Street, New York, N.Y.
Toys; post cards; craft work, and embroidery; books.

Dejonge, A., 71 Duane Street, New York, N.Y.
Paper; leather; skins.

Delaware Chair Company, The, Delaware, O.
Straw bottom chairs; other chairs.

Democratic Printing Company, The, Library Section, Madison, Wis.
Library supplies.

Dennison Paper Company, The, New York, Chicago, etc.

Denoyer-Geppert Company, 5235 Ravenswood Avenue, Chicago, Ill.
Makers and importers of maps, globes, models, charts, and pictures.

Detroit Lithograph Company, The, Detroit, Mich.
Post cards; pictures in color.

Devoe & Raynolds Company, Inc., 1 W. 47th Street, New York, N.Y.
Artists' materials; school show card, water colors and drawing inks.

Dick Company, A. B., Chicago, Ill.
Mimeographs.

Ditson Company, Charles, music publishers, New York, N.Y.

Ditson Company, Oliver, 179 Tremont Street, Boston, Mass.
Music publishers.

Dixon Crucible Company, The, Jersey City, N.J.
Crayons, pencils.

Dodson, J. H., Kankakee, Ill.
Everything for birds; also nature books, pictures.

Draper Shade Company, Spiceland, Ind.
Window shades, adjustable.

Educational Music Bureau, 64 E. Van Buren Street, Chicago, Ill.
School music supplies of all publishers; band instruments.

Eimer & Amend, Third Avenue at 19th Street, New York, N.Y.
Aniline dyes.

Elson Art Publication Company, Inc., Belmont, Mass.
Small and large pictures, plain and colored, loan exhibits, picture study material.

Embossing Company, The, Albany, N.Y.
Stabuilt blocks; toys; small tiles.

Emery School Art Company, 372 Boylston Street, Boston, Mass.
Colored reproductions of famous paintings.

Esterbrook Pen Company, The, Camden, N.J.

Fairbanks Art Company, 736 W. 173 Street, New York, N.Y.
"Kerr Costume Plates" Series.

Fairbanks-Morse Scales Company, New York, Chicago, etc.; also local hardware dealers.
School scales.

Favor, Ruhl & Co., 425 S. Wabash Avenue, Chicago, Ill.
Art supplies.

Marshall Field Company, Chicago, Ill.
Department store.

Fife Corporation, R. A., Mamaroneck, N.Y.
School supplies, furniture, manual arts supplies, playground apparatus.

Fischer, Carl, Cooper Square, New York, N.Y.; 430 S. Wabash Avenue, Chicago, Ill.; 252 Tremont Street, Boston, Mass.
Musical instruments.

Fischer, J., and Brothers, music publishers, 119 W. 4th Street, New York, N.Y.

Flanagan, A., Chicago, Ill.
School supplies, inexpensive books; booklets, etc.

Flexy Company, The.
Flexy dolls; now sold by Woolworth Ten Cent Stores.

Fulton Specialty Company, 128–142 Fulton Street, Elizabeth, N.J.
Stamp printing outfits.

Gabriel Sons, Samuel, Fifth Avenue, New York, N.Y.
Toys; games.

Gaylord Bros., 155 Gifford Street, Syracuse, N.Y.
Specialists in library supplies.

Geography Supply Bureau, The, 314 College Avenue, Ithaca, N.Y.
Lantern slides, minerals and rocks, wall pictures for school stereopticons, maps, books, and other school needs. Separate catalogues; specify.

Golding Press Division & American Type Founders Company, Franklin, Mass.
Printing machinery; paper-cutters.

Grand Central Wicker Shop, Inc., 226 E. 42d Street, New York, N.Y.
Wicker chairs, couches, etc.

Gray, Mrs. Mary, care of Mrs. Smoke, Box 11, Hogansburg, N.Y.
Indian beadwork, sweet-grass baskets.

Graybar Electric Company, 9 E. 41st Street, New York. N.Y.; 30 N. Michigan Avenue, Chicago, Ill.
Device for testing hearing in schools.

Gross, Edward, Art and Picture Shop, 19th Street and Broadway, New York, N.Y.
Pictures; modern color prints.

Gunn & Latchford, 261 Fifth Avenue, New York, N.Y.
Egyptian patchwork; India prints; Oriental goods.

Hammacher-Schlemmer Company, 4th Avenue and 13th Street, New York, N.Y.
Tools; hardware; bench; vises.

Hammett, J. L., Newark, N.J., Springfield, Mass.
School supplies — very extensive stock.

Harrington Cutlery Company (wholesale only), Southbridge, Mass.
"Dexter" Manual Training and stencil tool knives for sloyd, scribing, chip, carving, and stencil work.

Harter School Supply Company, 271 Ninth Street, Brooklyn, N.Y.
Fisher Building, Van Buren and Dearborn Streets, Chicago, Ill.
Inks and adhesives; seat work of all kinds.

Holliston Mills, The, Norwood, Mass.; 32 W. 18th Street, New York, N.Y.
Fine book cloths; leatherette; buckram.

Houghton Mifflin Company, 2 Park Street, Boston, Mass.
Books; pictorial maps.

Howe Scales Company, The, 1126 S. Wabash Avenue, Chicago, Ill.
School scales.

Hubbell, J. S. (dealer), Canada, Ariz.
Indian plaques and blankets.

Japan Paper Company, The, 109 East 31st Street, New York, N.Y., Philadelphia, Pa.; Boston, Mass.; San Francisco, Cal.
Importers of art and colored papers of all kinds.

Johnson Company, George T., 78 High Street, Boston, Mass.
Study project series; seat work, etc.

Junglegym, Jr., The, 5 Irving Terrace, Cambridge, Mass.
Play apparatus for young children.

Kelsey Press Company, The, Meriden, Conn.
Paper-cutter, presses, type, ink, paper, cards, envelopes, stationery, etc.

Keystone View Company, Meadville, Pa.
Lantern slides for geography, history, and other school subjects; Reading material.

Knowlton Company, D. K., Farmington, Me.
Inexpensive reading materials.

Laidlaw Brothers, 2001 Calumet Avenue, Chicago, Ill.
Seat work; study-period projects.

Leonard, M. S., 2230 Van Hise Avenue, Madison, Wis.

Lesch, Rudolf, 225 Fifth Avenue, New York, N.Y.
Colored lithographs, silhouettes, post cards, and other pictures.

Library Bureau, The, 224 Albany Street, Cambridge, Mass.; 315 Fifth Avenue, New York, N.Y.; 216 W. Monroe Street, Chicago, Ill.
Library equipment.

Lindenmeyer, Henry & Sons, New York, N.Y., Newark, N.J., and Hartford, Conn.
Art and commercial papers.

Longmans, Green & Co., 55 Fifth Avenue, New York, N.Y.
Historical and natural history pictures; books.

Loose Leaf Education, Inc., Columbus, O.
Weekly News Sheets for children.

Macy Company, The (department store), New York, N.Y.
Toys, pets, animals; household goods.

Mail-order firms. See List VII.

McKay Company, The David, 610 Washington Square, Philadelphia, Pa.
LeMair post cards.

McKinley Publishing Co., The Philadelphia, Pa. 1623 Ranstead Street.
Maps; "History Topics," notes; pictures.

McKnight & McKnight, Normal, Ill.
Geographical publishers.

Medici Society, 755 Boylston Street, Boston, Mass.
Pictures; prints.

Meeker, Ezra, Seattle, Wash.
Post cards (history, geography).

Miessner Piano Company, 110–120 Reed Street, Milwaukee, Wis.
Small movable piano.

Millar Paper Company, The George W., New York, N.Y.
Wrapping paper; bogus and kraft papers; paper towels.

Miller Rubber Company, New York, N.Y.
Rubber balls.

Minnett Company, 365 Lexington Street, New York, N.Y.
Willow furniture.

Mohonk Lodge (catalogue), Colony, Okla.
Basketry, beadwork, rugs, etc.

Muralto Company, The, New Brighton, N.Y.
Calcimine; muralto for children's painting.

National Analine and Chemical Company, New York, N.Y.
Dyes.

National Committee for Better Films, The, 70 Fifth Avenue, New York, N.Y.

National Washboard Company, The, 310 S. Michigan Avenue, Chicago, Ill.
Toy washboards.

New York Aquarium, Battery Park, New York, N.Y.
Post card studies of fish.

North American Dye Corporation, Mount Vernon, N.Y.

Nystrom, A. J., & Co., 2249–53 Calumet Avenue, Chicago, Ill.
History, geography, biology material; Kuhbriest series maps; pictures; charts; globes.

Oriental dealers. See List X.

Orlandi Statuary Company, 459 Milwaukee Avenue, Chicago, Ill.
Plaster casts.

Owen Publishing Company, The F. A., Danville, N.Y.
Inexpensive reading materials.

Packard, Winthrop, Canton, Mass.
Everything for wild birds.

Parker, C. M., Publishing Company, Taylorville, Ind.
Inexpensive reading materials.

Parker School, The Francis W., 330 Webster Avenue, Chicago, Ill.
Leaflets, books; inexpensive reading material.

Pavatea, Tom (Indian), Polacca, Ariz.
Plaques, basketry, and pottery.

Payson's Gift Shop. Pawtucket, R.I.

Pendleton & Townsend, Patterson, N.Y.
Blocks (curved; hollow); boards; tables, etc.

Penn Publishing Company, The, Philadelphia, Pa.
Inexpensive reading material.

Perry Picture Company, Malden, Mass.
Miniature pictures.

Phillips, George & Son, 32 Fleet Street, London, Eng.
Historical pictures.

Playground equipment. Obtain addresses from Playground and Recreation Association of America.

Plimpton Scofield Company, 80 Boylston Street, Boston, Mass.
"The Corrective Posture Group." School furniture designed by Dr. Joel Goldthwaite.

Plymouth Press, 7851 Lowe Avenue, Chicago, Ill.
Seat work; reading material; charts.

Poets' Guild, The, Christodora House, 147 Avenue B, New York, N.Y.
Loose-leaf poems.

Prang Company, The, New York, Chicago, etc.
Art goods; school supplies.

Rand McNally, publishers, New York and Chicago.
Maps (Goode series); books, etc.

Remington Typewriter Company, The, New York, Chicago, etc.

Robinson Company, W. H., 905 Pine Street, Seattle, Wash.
Small dolls ("Tilicum Tots").

Rochester Germicide Company, Rochester, N.Y.
"Sol-o-Kee" for animal cages.

Rom, N. C., Copenhagen, Denmark.
Pictures of vikings.

Root Company, A. I., Medina, O.; 7 Commerce Street, Norfolk, Va.
Insect materials; observation beehives; nets, boxes.

Rouss, Charles B., 594 Broadway, New York, N.Y.
Materials for costumes at low prices; mosquito netting; muslin by piece; socks, etc. Will sell to schools only if the firm has no representatives among merchants in town. Investigate.

Ruxton, Philip, Inc., New York, N.Y.; also, Chicago, Ill.; Boston, Mass.; Battle Creek, Mich.; St. Paul, Minn.; St. Louis, Mo.
Printers' inks (black, colored, gold, silver).

Schirmer, G., music publishers, New York, N.Y.
High standard music of all kinds.

Schoenhut Toy Company, A., Philadelphia, Pa.
Hill blocks; dolls; toys.

School supply houses. See List VIII.

Schwartz Toy Company, F. A. D., 5th Avenue, New York, N.Y.

Science-supply firms. See List IX.

Scientific Seating Company, 35 Warren Street, New York, N.Y.
School furniture.

Sea Arts Guild, Milwaukee, Wis.
Everything about boats and ships; books, models, pictorial maps, and charts; pictures.

Sibley, Edward L., Bennington, Vt.
The "Challenge Eyelet Press."

Singer Sewing Machine Company, The, New York, Chicago, etc.; also local agents.

Sheldon, E. H. & Co., Muskegon, Mich.
Manual training benches, vises, etc.

Society for Visual Education, The, Chicago, Ill.
Magazine; picture machines; pamphlets; films; slides.

S. & S. Hardware Company, Inc., 639 Sixth Avenue, New York, N.Y.
Folding brackets for shelves, which drop against wall when not in use.

Standard Electric Time Company, Springfield, Mass.
Electric clock systems.

Stohr, A. C. (dealer), Lame Deer, Mont.
Indian moccasins

Syracuse Basket Company, 361 Clairemonte Street, Syracuse, N.Y.
Willow furniture; baskets.

Tabor Prang Art Company, 225 Fifth Avenue, New York, N.Y.
Facsimile. "Declaration of Independence."

Tudor Art Shop, 7 Parley Vale, Boston, Mass.
Christmas transparencies; silhouette pictures.

Underwood Typewriter Company, The, New York and Chicago.

Unit Press, The, Fitchburg, Mass.
Unit poems (leaflet form).

United States Printing and Lithograph Company, The, fine arts section, 6 East 39th Street, New York, N.Y.
Pictures, post cards, etc.

Universal Fixture Company, 133 West 23d Street, New York, N.Y.
Bulletin or display boards.

Verneau, Eugene, 108 Rue de la Folie-Mericourt, Paris, France.
Revière lithographs.

Waldcraft Company, The, Indianapolis, Ind.
Printing dyes.

Wanamaker, John, Department Store, New York, N.Y.; Philadelphia, Pa.
Toy department; pets and animals department; house furnishing; children's books.

Ward's Natural Science Establishment, 85 College Street, Rochester, N.Y.
Specimens: cocoons, minerals, etc.

Weigel, Adolph, Winter Garten Strasse 4, Leipzig, Germany.
Dealer in autolithographs, German color prints.

Womrath, Arthur R., Inc., 21 West 45th Street, New York, N.Y
Rent Library, used books.

World Book Company, Yonkers, N.Y.
Winnetka arithmetic materials.

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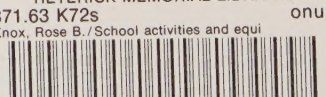

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